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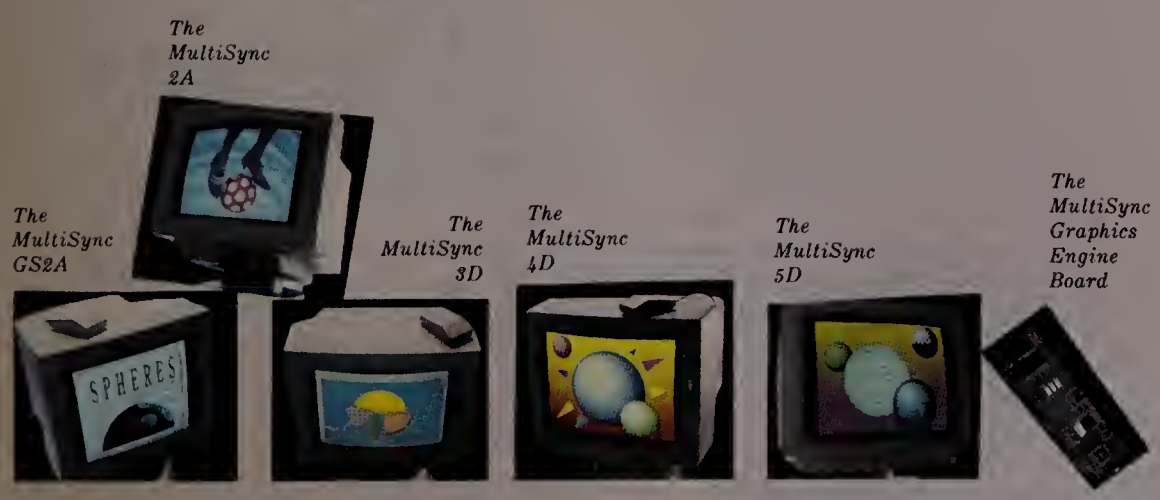

NEC

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..., ...ont porch, and sync timings).

PC FACT FILE
EDITOR'S CHOICE

NEC MultiSync Graphics Engine
NEC Technologies Inc., 1255 Michael Dr., Wood Dale, IL 60191, (708) 860-9500.
List Price: $1,999.
Requires: 8514 or higher-resolution monitor
In Short: A coprocessor board with built-in VGA that's programmable to accept a wide range of monitors. Easily installed and supported by copious documentation, this is an excellent buy for any application.

CIRCLE 616 ON READER SERVICE CARD

APRIL 10, 1990 PC MAGAZINE 163

accelerator software to dramatically boost the speed of Windows and Presentation Manager applications,

NEC M

The superb
MultiSync 4D

The Bottom Line If you use high-resolution graphics and windowing environments, NEC's monitors won't disappoint.

MULTISYNC 4D

The user-friendly Swiss army knife of multiscanning monitors, the NEC Multisync 3D displays bright, true colors and very sharp text and graphics. All controls are conveniently mounted up front, including microprocessor controlled push buttons for manually adjusting screen size.

Bearing this in mind, our top pick of the products reviewed here is the NEC Multisync GS2A. It has an optional higher resolution than the rest, and the NEC's large, flat screen enhanced viewing with superior glare protection. The higher resolution means

Seldom does a company dominate a market the way that NEC does with multiscanning monitors, and its latest innovations show why.

That hasn't

The Multisync 3D, which includes a 9-pin and 15-pin video cable, is the best of the multiscanning monitors we tested.

PC FACT FILE
EDITOR'S CHOICE

NEC MultiSync 4D
NEC Technologies Inc., 1255 Michael Dr., Wood Dale, IL 60191, (708) 860-0335.
List Price: $1,699 (cable included).
Requires: VGA, Super VGA, 8514 A, or 1,024 x 768 graphics adapter
Diagonal Screen Size: 16 in.
In Short: The 16-inch NEC MultiSync 4D is the lowest-priced monitor in the MultiSync line to support 1,024-by-768 noninterlaced resolution. It can store settings in its digital memory.

CIRCLE 614 ON READER SERVICE CARD

CORPORATE WEEK SATISFACTION POLL

A BEST-TO-SELL WINNER
MONITOR:
NECHE MULTISYNC 2A
With high-performance monitors, quality and reliability may be more important than price. And with so many graphics standards out there, software compatibility is a big issue. The MultiSync 2A 14-inch color monitor from NEC Home Electronics (U.S.A.) delivers on all counts.

By moving graphics screens at a blistering pace, the Graphics Engine brings improved performance to desktop publishing, CAD, and other graphics applications and

The 4D's appr
elegant in the extr

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PC Communications

Monitors Look to the Future

displays of NEC's new
) and 5D monitors por-

MultiSync 5D offers simil

The Bottom Line The MultiSync Graphics Engine has the power to put Windows or PM into the mainstream.

NEC MultiSync 3D

BEST BUY

PROS: Supports all boards, "remembers" screen adjustments. 28mm dot pitch

Overall, the NEC MultiSync Graphics Engine is powerful, versatile, and fast—it is a perfect match either for an NEC monitor or for the high-resolution monitor of your choosing.

MultiSync 2A, MultiSync 3D

"Works Better!"

"Looks Great!"

. I'd take the crisp NEC over the fuzzy IBM image any day.

been said.

If you want a monitor for VGA level and up, the NEC MultiSync 4D is an excellent choice.

Buyers of NEC's MultiSync 2A awarded that monitor the highest scores in the four top-ranked attributes—i

pach to storing settings is
reme.

FINALISTS

NEC MultiSync 3D, 4D, and 5D monitors

- Jerry Benson, Tom Grau, Wayne Hinson, Keith Schaefer
- NEC Home Electronics (U.S.A.) Inc., 1255 Michael Dr., Wood Dale, IL 60191; (312) 860-9500

NEC got out in front first with the MultiSync—and stayed there. The 3D, 4D, and 5D monitors are significant additions to the MultiSync family. They add digital controls and automatic recall of user preferences for each video mode to a product line that's already won the Award for Technical Excellence and numerous Editor's Choices. The 4D monitor takes multiscanning into a new dimension: the 16-inch tube may prove to be the perfect size for high-resolution color work in cramped offices.

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PC WORLD

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Cover photograph by Fred Stimson

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• AST's upgradable ISA system and NCR's powerful Micro Channel box show off the power of the 486
• QMS's PS 410 reads incoming jobs and switches effortlessly between modes
• Connect to the leading SQL data servers with *DataEase SQL*
• Sharp unveils a lightweight laptop and a luggable SX-based portable
• OCR gets easier with two releases of *ReadRight*
• A *DrawPerfect* upgrade lets you distribute run-time slide shows
• One Token-Ring card—DCA's IRMAtrac—fits ISA and Micro Channel slots
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October 1990

Volume 8, Number 10

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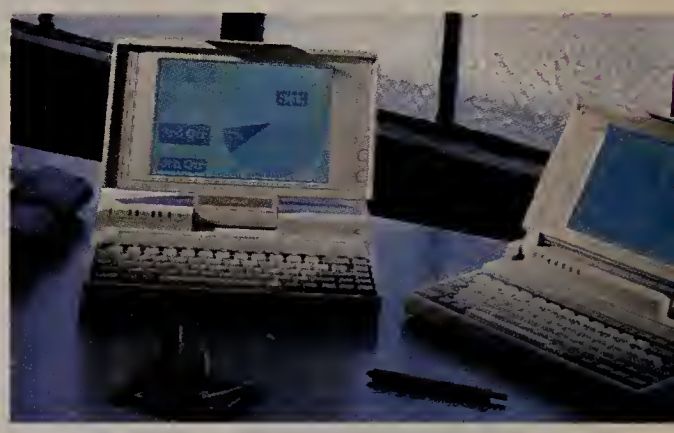

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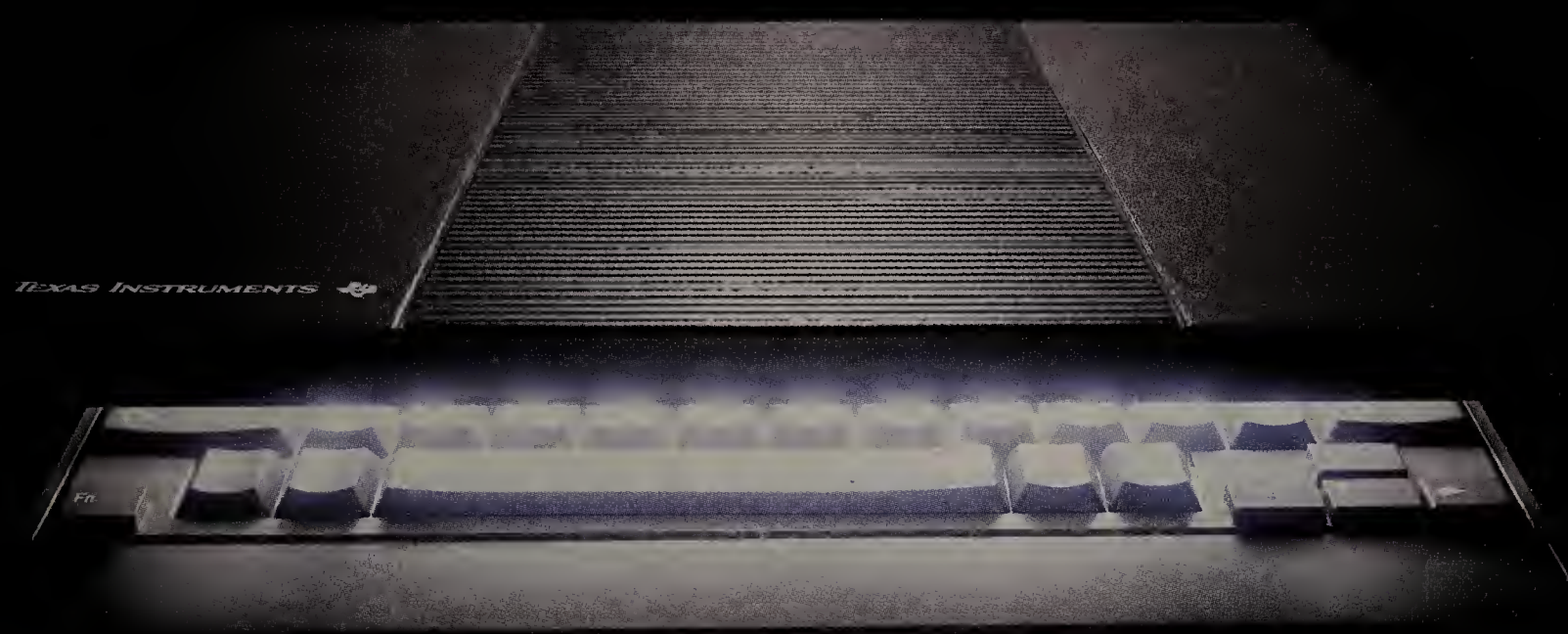

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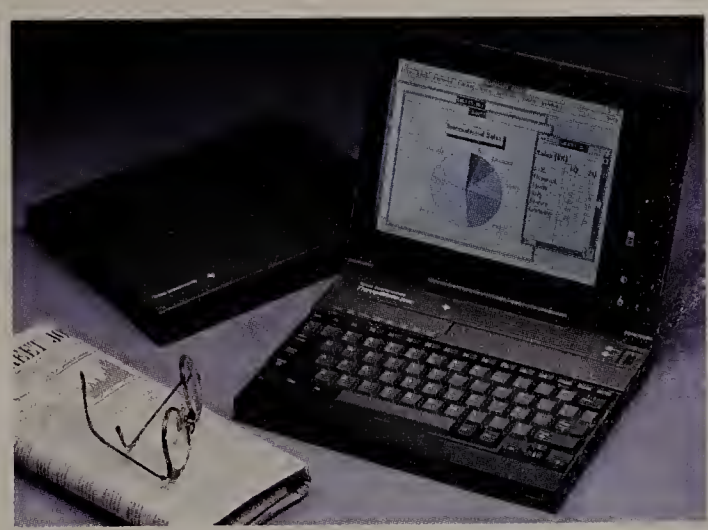

Large VGA screen with leadership display technology.

You'll appreciate the technology behind the 10″ diagonal VGA display. It's a remarkable feature for a computer that's notebook size. The high-resolution 640 x 480 supertwist screen easily handles demanding windowing and graphics applications.

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The TM 2000 has the power to run your favorite software — 12 MHz 80C286 processor, 20MB hard disk drive and 1MB of RAM. A built-in, rechargeable battery lets you work up to two hours. With an optional add-on battery, you can work up to five hours — enough for coast-to-coast flights.

You also get a full-function AT enhanced keyboard, so you can work with the same feel of your desktop PC.

In addition, we've loaded MS-DOS® and LapLink™ in ROM, and preformatted the hard disk.

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TEXAS INSTRUMENTS

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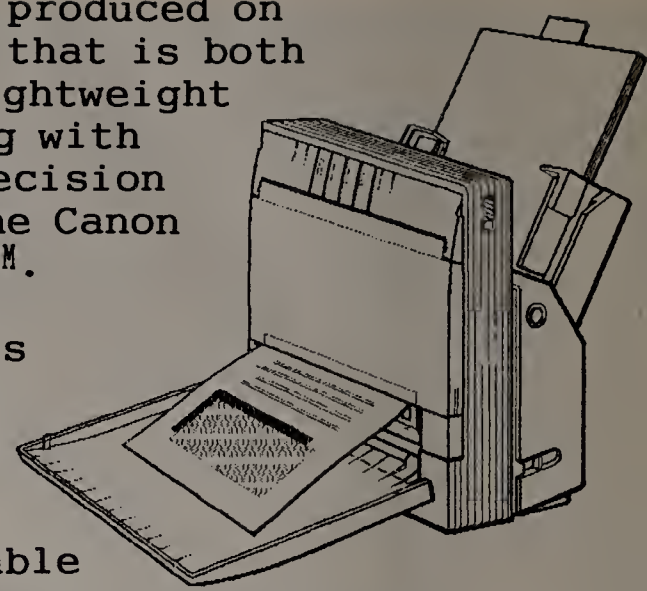
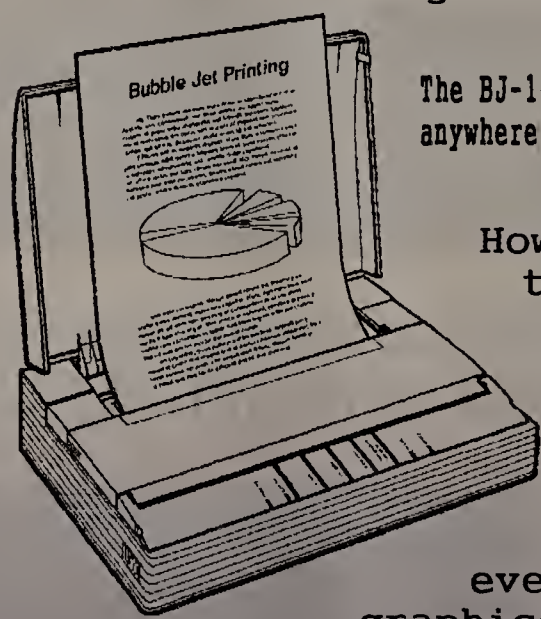
This document was produced on the first printer that is both a desktop and a lightweight portable, printing with letter quality precision on plain paper. The Canon BJ-10e Bubble Jet ™.



The BJ-10e with its optional 30-sheet feeder printing on a desk.

On a desk, with its optional 30-sheet paper feeder, it's an ideal personal printer. As a single-sheet portable with its optional rechargeable battery pack, it weighs a remarkable 4.6 pounds and prints on a variety of paper. The BJ-10e emulates the IBM® Proprinter™ X24E, so you can use a wide range of applications software.



The BJ-10e printing a single sheet anywhere you want.

How fast is it? It printed this page on ordinary 8 1/2"x11" paper at 83 characters per second. It won't slow down when printing in **bold** or various type sizes either. It even handles complicated graphics, as you see in these scanned-in BJ-10e illustrations.

What's more, its blacks are intensely black and its ink dries instantly, so it never smears.

Another page in printer history.

How quiet is it? Quiet enough to be used in the middle of the night with someone asleep a few feet away.

And, you never have to worry about maintenance because it uses a pop-in BJ cartridge which contains the print head and the ink supply. Every cartridge prints approximately 700,000 characters (HQ mode), making it as economical to use as it is to buy.

But best of all, the BJ-10e works everywhere you could possibly need it, fitting neatly into a briefcase with its optional rechargeable battery pack.

The Canon BJ-10e Bubble Jet. What other printers print on a desk, it prints anywhere.

Canon BJ-10e
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ACTUAL SIZE

BUBBLE JET

The document displayed in the BJ-10e is actual output from Aldus® PageMaker® software using the IBM Proprinter X24E printer driver.

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Circle 49 on reader service card

TAKEOVER
REMOTE CONTROL SOFTWARE™

PC MAGAZINE
EDITORS' CHOICE
June 12, 1990
Takeover, Version 1.0

". . . a fresh approach to remote computing."

— PC Magazine, June 12, 1990

"TAKEOVER™ is a friendly program offering a powerful unattended control capability. One copy gives both remote and host capacities to two PCs. This combined communications and remote-control package offers users speed and simplicity."

— PC Magazine, June 12, 1990

We think TAKEOVER is everything a remote control software product should be. *PC Magazine* agrees with us, which is why they awarded TAKEOVER the coveted "Editors' Choice" award. TAKEOVER includes all the features of MIRROR III™, so you can perform either remote control or general communications. TAKEOVER also offers these and many other features:

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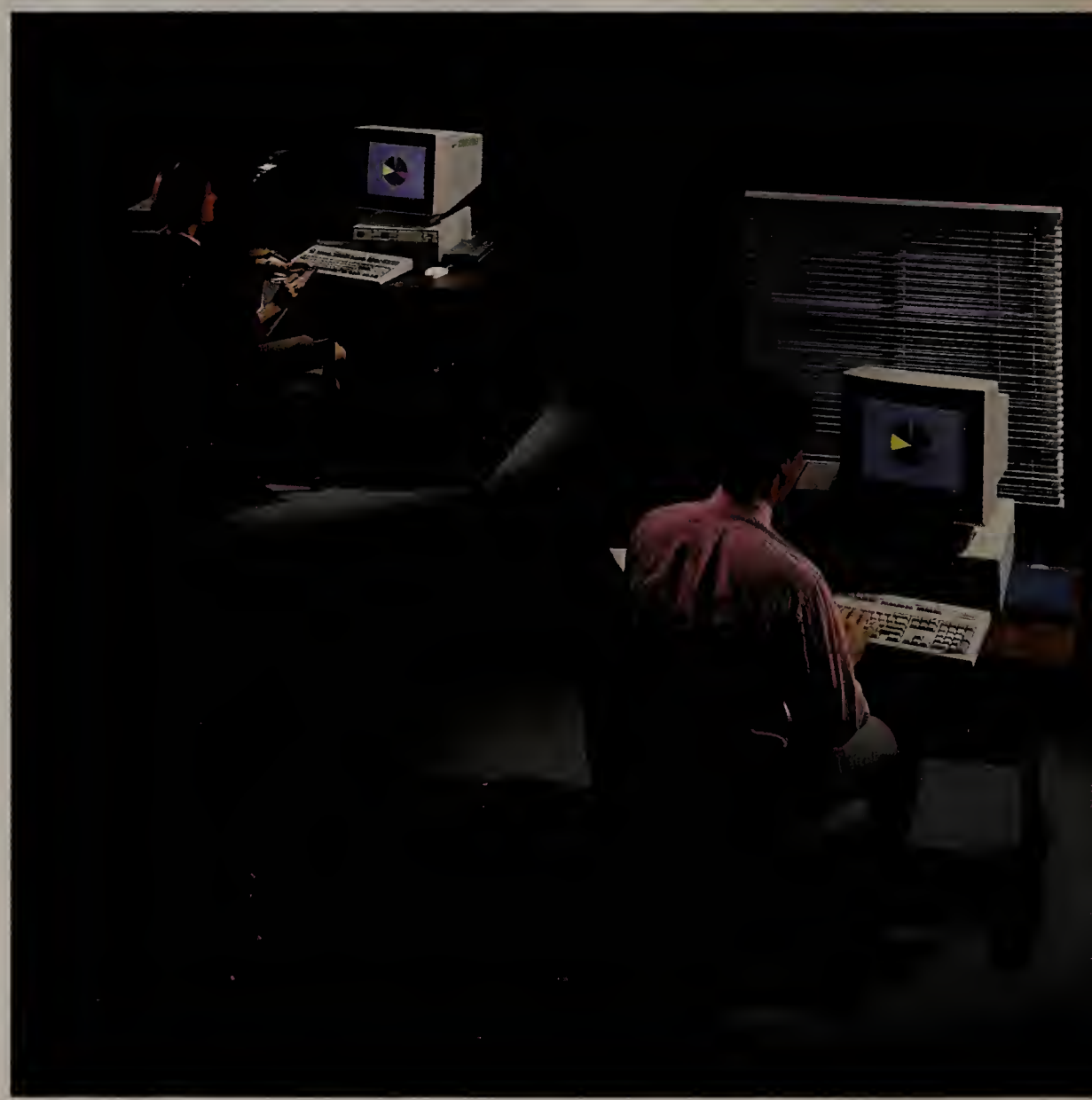
- Password Security with automatic call back
- Wide array of file transfer protocols and terminal emulations
- PRISM™ script language that lets you automate your sessions
- 60-Day Money-back Guarantee
- Technical Support at no charge



TAKEOVER includes both the Guest and Host software on 5.25″ and 3.5″ disk formats and runs on IBM® or 100% compatibles running MS-DOS 2.0 or higher. TAKEOVER supports Hayes® compatible modems, or direct serial connections (COM 1 - 4) up to 57,600bps. Guest memory usage is 480K and Host memory usage is 55 - 70K, depending upon configuration.

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Circle 236 on reader service card

Our World Class counting crew: Robert Luhn, Larry Wilson, Bill Segovia, and Daniel Tynan

ROBERT CARDIN

Person to Person

There's nothing quite like the World Class Awards. Most of the time, computer users get to vote with their pocketbooks—period. Once a year, though, they get the chance to send a message directly to the industry, with *PC World* playing the middleman.

You'd think tallying the World Class contest results would be a piece of cake. Sift through a pile of postcards, jot down the totals on a legal pad, and start calling the winners, right? Well, not exactly.

Larry Wilson, whose Wilson Research Group counted the ballots for the eighth consecutive year, figures a few numbers might put the job in better perspective.

Start with several dozen mailbags containing a total of 30,196 ballots, he says. Figure that the typical respondent votes in 40 percent of the 37 categories, and you get a staggering total of nearly 450,000 individual opinions that have to be painstakingly recorded.

Now increase the complexity by at least a couple of orders of magnitude, because the free-form ballot gives respondents a nearly infinite range of choices. "In the Mass Storage and Desktop Computer categories alone," Wilson observes, "somewhere between 500 and 600 individual products got votes." Finally, toss in the challenge of deciphering thousands upon thousands of handwriting samples. Senior Editor Robert Luhn admits, "It's a detective job sometimes, trying to figure out what the voters really intended."

None of our World Class team members objected to sorting through the mountains of paper, though. There's something refreshing—and occasionally intriguing—about being this close to so many *PC World* readers. Assistant Research Manager Bill Segovia kept an eye on the postmarks as the trickle of incoming mail turned into a flood. "It's truly a world-class event," he maintains. "This year we got entries from places where you wouldn't expect to find PCs—much less *PC World* readers! We got letters from out-of-the-way places like Okinawa, Turkey, and Iran."

Assistant Editor Dan Tynan interviewed a random sampling of respondents for our feature coverage of the World Class contest results. "I was struck by two things," he reports, "first by the diversity of users, and then by the strength of their opinions. They have a fierce loyalty to their favorite software and hardware. Some people are that way about their cars, but computers inspire an almost fanatical level of enthusiasm."

Wilson's counting crew observed the same intensity of opinion, especially in the newly added Service-and-Support categories: "It was amazing how many people used the free-form comments section to rave about WordPerfect's support policies. I hope other vendors are paying attention—those votes might do some real good."

In addition to the mention in this month's feature, every winning company receives an engraved trophy to commemorate the occasion. Most often, a *PC World* editor makes the presentation to an audience that includes not just CEOs and marketing managers, but programmers, tech support personnel, and receptionists as well. That's the final link in the chain that extends from the PC consumer to the hundreds of people who make a World Class Award–winning product possible.

When we talk to this year's winners, we'll be sure to give them your regards.

Ed Bott

Ed Bott
Managing Editor

33-MHz, 80386, What Else Can

EISA... $1995 We Say?

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Introducing the ALR BusinessVEISA Model 101...

What else can we say about a deal that's this good? Well, maybe we could add that the ALR BusinessVEISA 386/33 Model 101 also lets you ***"just upgrade the CPU™."*** It's the only affordable upgrade path to 25- or 33-MHz i486™ processing, and beyond. And perhaps we should also mention that this system can accommodate up to 17-MB of memory right on the system board. And it probably wouldn't hurt to talk about the standard 1-MB of RAM, built-in IDE hard drive controller, optional cache module, standard 1.2-MB 5.25" floppy drive, standard serial and parallel ports, and ALR's limited one-year warranty.

But, quite honestly, none of those features are quite as impressive as this one. For just **$1995**, you can purchase a **33-MHz 386™-based** PC with a **true 32-bit EISA bus** — to easily tackle today's power applications in business, desktop publishing, CAD/CAM, multiuser and networking. Who else makes a system that can match the BusinessVEISA 386/33 Model 101 in price, versatility, and performance? Nobody.

Call ALR today and we'll put you in touch with your closest ALR reseller:

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ALR systems are available at these selected resellers:

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Prices and configurations subject to change without notice. Prices based on U.S. Dollars. Shown with optional monitor and mouse. ALR is a registered trademark and BusinessVEISA is a trademark of Advanced Logic Research, Inc. All other brand and product names are trademarks or registered trademarks of their respective owners. © 1990 by Advanced Logic Research, Inc. *AST®, here's one more thing!*

Circle 22 on reader service card

Only LANtastic's tiny RAM can make businesses this small link big.

To anyone who still believes that all big-capability PC networks demand big bucks, big hassles and big RAM, we'd like to offer a small suggestion:

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You see, only LANtastic gives you full-featured networking at a price small businesses can afford—as little as $249* per computer.

So that you can link as few as two PCs. And grow to hundreds of PCs. Without sacrificing capabilities or speed.

And only LANtastic uses the smallest RAM of any LAN—under 12K on a workstation and less than 40K on a server—yet still delivers sophisticated disk, file, program and printer sharing, plus security, E-mail, CD-ROM support, NetBIOS-compatibility and more.

And only LANtastic gives you a special windowed menu that will lead you by the hand through the set-up process. So you can be up and running before lunchtime.

PC MAGAZINE EDITORS' CHOICE March 28 1989 LANtastic

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LAN MAN 2.0 APPEARS

Microsoft Ups Ante in Battle of the Networks

Microsoft has launched its most serious challenge ever to Novell with the release of new versions of its *LAN Manager* and *SQL Server* and the announcement of a $21 million investment in networking over the next 12 months alone.

The software giant expects to authorize 600 *LAN Manager* and *SQL Server* resellers in the United States over the next year, and to back them up with 400 sales and support people. The company will reach out to customers by holding hundreds of networking seminars nationwide. The marketing bill alone will exceed $16 million, while another $5 million will be spent to purchase technology, and an unspecified amount to create a 260-person R&D staff.

"It's a very serious challenge to a very serious competitor," says Senior Product Manager David Thatcher. Novell has only half of Microsoft's revenues, but it boasts an estimated 10,000 NetWare resellers, and all 2000 employees are focused on protecting the company's 65 percent–plus share of PC network sales.

Microsoft claims that its "single-version" pricing on *LAN Manager 2.0* and *SQL Server 1.1* makes the former cheaper than NetWare, which offers different versions for different-sized servers. *SQL Server 1.1* improvements are minor, but the new *LAN Manager* gets a major speed boost —slowness was version 1.0's most serious shortcoming— that Thatcher claims makes it as fast as NetWare 386. Version 2.0 also adds enhanced security, backup, fault tolerance, network management, and other features that are either missing from some NetWare versions or cost extra.

Novell is vulnerable in some areas, agrees International Data Corporation analyst Lee Doyle, "but it will take a while to bake this particular cake." He expects Novell to remain the de facto standard for the next three to four years.

SYSTEM PRICES FALL

Portables, Desktop 386s Slip Most, SXs Hold On

Now that leading vendors have overcome their supply constraints and nearly everyone is piling onto the portables bandwagon, pricing on notebook and laptop PCs has hit the skids.

Parade leader Compaq chopped the suggested list price for its LTE/286 with 20MB hard drive from $3999 to $3499, while the price of Toshiba's comparable T1200-XE dropped $800 to $3199. Tandy started low, introducing its 1500HD at $1999 (which is also the street price). Heavier 386SX-based laptops also are slimming down pricewise: CompuAdd's 40MB-equipped 316SL debuted at $2895.

The desktop picture is more complicated. IBM slashed price tags on several Model 60s and 80s, as did Compaq with the Deskpro 386/33, but these are being phased out. Compaq also cut pricing on Systempros by up to 18 percent and on Deskpro 486s by up to 14 percent. Smaller players are even more aggressive. Telling analysts that it will live with lower profit margins for a while, AST Research cut prices as much as 26 percent on 386 machines and 23 percent on 486s, but only 11 percent on SX models.

Prices are holding on other vendors' fast-selling SX machines too. Tandy lopped $1000 off all its middle- to high-end 386s in the past year but left its SX untouched. Analysts say that vendors would like to sell more SXs at lower prices, but that Intel, the SX's sole supplier, underestimated demand. "The 80386 DX, SX, and 486 are all on allocation," an Intel spokesperson admits. "The SX has the highest [unmet] demand."

Generally, street prices held up quite well this summer, notes John Murphy of Wohl Associates. Heavy dealer discounting remains the rule, but vendors are trying to maintain a price floor by adding features such as extra memory. For example, Zenith Data Systems bundles *Windows 3.0* and a mouse with its business machines.

IBM SPINS OFF PRINTERS

Sharpens Challenge to Hewlett-Packard

IBM plans to sell the majority interest in its Information Products subsidiary, which manufactures lasers and other peripherals and supplies. "IBM isn't getting out of this business," explains International Data Corporation researcher Angele Boyd; the move could make IBM a stronger rival to Hewlett-Packard and heighten the competition that's boosting laser printer price/performance ratios.

IBM's Information Products annually sells more than $2 billion worth of typewriters, desktop and minicomputer printers, keyboards, and office supplies. By year-end IBM hopes to sell the majority interest in its U.S. operations to Clayton and Dubilier, a private investment firm specializing in leveraged buyouts. The move will let the computer giant focus on its core markets, while Information Products can reduce overhead and react more quickly to market shifts, executives explain. The subsidiary will start by trimming 1200 of its 6000 employees.

IBM will keep selling products under its logo through existing distribution channels and will retain effective control over key product development. Unlike most rivals, Information Products builds its own laser engines and now will be free to sell to IBM competitors. The company's year-old LaserPrinter line competes very well with HP LaserJets on price and features, BIS CAP International's Marc Boer says, but has not been pushed hard enough.

GORDON STUDER

VGA ADAPTERS REBORN

Cheap Chip Offers Huge Color Palette, No Jaggies

With IBM reportedly poised to unleash yet another expensive high-end graphics standard on PC users, a small technology firm has developed an alternative approach, offering a stunning enhancement to existing VGA adapters at a minimal cost. Edsun Laboratories' Continuous Edge Graphics (CEG) is a single chip that will enable both new and existing VGA boards to produce near-photolike images on standard VGA monitors. CEG will be built into VGA boards and systems arriving late this year or early in 1991—Monolithic's $895 MicroPAQ among the first.

Vanilla VGA shows only 256 simultaneous colors, and this, rather than its 640-by-480-pixel resolution, is the largest barrier to achieving photolike quality. In contrast, the CEG chip theoretically can generate more than 740,000 colors through a unique way of juggling 8 bits of color information. And you need not even add memory to the adapter. Moreover, CEG combines its boosted color capabilities with intelligent anti-aliasing techniques to remove "jaggies" from lines. There's a slight performance hit, but "the images are beautiful," enthuses Dataquest analyst Clyde Spencer.

Edsun has allied with Analog Devices to offer CEG for $15 in quantities of 100,000, a less-than-$100 price premium for CEG-equipped graphics boards. Edsun is writing device drivers for *1-2-3*, *AutoCAD*, and *Windows 3.0* and is working with software vendors to support other packages. With packages that don't support it, the CEG chip mimics standard VGA operation.

"CEG will extend the longevity of VGA as a viable standard," says Spencer, "and act as a barrier to the entry and success of higher-resolution products."

ARE 2.88MB FLOPPIES COMING?

Media and Disk Vendors Look for a Leader

Is there a 2.88MB floppy in your computer's future? Disk drive and media industry insiders are sure IBM and others will introduce systems this year with 3½-inch drives that read and write this new data capacity along with 720K and 1.44MB. One source saw the drives being shipped to IBM.

Nearly every major media and drive maker has tooled up to produce all the market can use, reports Laurence Lueck, president of Magnetic Media Information Services. But then, he adds, suppliers have been ready since early this year, when they expected IBM to adopt the new standard. Instead of selling 20 million 2.88MB barium-ferrite floppies this year, they'll ship only 3 million—mostly to Japanese word processor makers like Toshiba, a leader in developing the technology. Competing standards include a 10.2MB format being pushed by Japanese system kingpin NEC. Without a champion like IBM, 2.88MB may never catch on, says Lueck.

Others in the disk drive and media industries are sure it will, however, including Ed Kay, president of Practidisk, which makes 2.88MB replacement drives for the installed base of PCs. His sources assure him that IBM will introduce 2.88MB-equipped desktops this fall and that Toshiba will put them into its laptops. Gerald Korth, president of Memory Control Technology, which supplies floppy test equipment, says all Japanese systems makers are ready to go if IBM does. Vendors decline to reveal product plans.

Price is an issue, but a minor one. Korth estimates that a 2.88MB drive would add less than $50 to system prices. An ANSI committee debate over standards created some delay, says Kay. There also are concerns over compatibility with prior and future versions of DOS, but Kay's firm solved those problems with a simple device driver. Sources close to Microsoft report that DOS 5.0 will support 2.88MB disks.

COMPAQ SWITCHES TO EISA

Multiprocessing Control Programs Delayed, But EISA Development Runs Ahead of Schedule

Multiple-processor PCs are spreading more slowly than expected, but the move from Industry Standard Architecture to Extended ISA (EISA) buses is going so well that Compaq Computer is switching to EISA for all new products, including laptops.

When Compaq, the leading supplier of multiple-processor computers, introduced its dual-processor Systempro in November 1989, it anticipated the release of multiprocessor-capable network operating systems from Microsoft and Novell by March and June, respectively. But *LAN Manager 2.0* debuted in August without the promised capability to divide the Systempro's dual processors between application and network server duties.

Those extensions should arrive in the fourth quarter, says Gary Stimac, Compaq senior vice president of engineering. Compaq didn't want to hold up *2.0*, he says, because the firm still enhances the Systempro with its support for intelligent drive arrays and the 32-bit I/O of EISA boards.

Meanwhile, a fault tolerance extension for Novell's NetWare 386 that allows multiple Systempro servers to be hooked together won't appear until 1991. Multiprocessing is available under UNIX, but two-thirds of Systempros still go out as single-processor Novell file servers. Sales are brisk, insists Stimac, but it will be two to three years before either market demand or software support catches up to Compaq's original notion of a four-processor Systempro.

However, less than a year after introducing its first EISA bus on the Systempro, Compaq is finding the manufacturing cost advantages of the older ISA (or AT) bus disappearing. ISA still has sufficient data-carrying capacity to satisfy most PC tasks, says Stimac. But Compaq should soon be able to give its customers the added capabilities of EISA without charging extra, so it plans to ship the new bus when feasible on all new releases, including portables.

AST Research will still ship ISA but projects that its users will prefer EISA within a year. Dataquest analyst Robert Charlton expects EISA to overtake its longer-lived competitor, IBM's Micro Channel architecture, by 1993.

GORDON STUDER

How to answer the needs of 386 users with just one line.

It's the COMPAQ line of high-performance 386 desktop personal computers. We designed each one with just the right balance of quality COMPAQ features and Intel 386 power. Giving you the perfect choice for every user, at every level.

Just turn the page for proof. We put extensive information about the entire line on a handy, removable reference chart. From the COMPAQ DESKPRO 386/33L to the COMPAQ DESKPRO 386N you'll find six levels of 386 performance designed to meet the wide range of your desktop computing needs. Each personal computer is built to be compatible with the industry-standard hardware and software you've invested in.

But why did Compaq create such a broad 386 desktop line? Because you told us to.

At Compaq, our first rule is to build computers that literally answer our users' very latest needs. So we regularly seek out a variety of PC users like you. We ask questions, probe for input—even criticism.

We then combine all these ideas with our own innovative thinking and the best of the latest PC technology, to create products that deliver not just high performance, but the *right* combination of features for you.

That's how we started this line, when we introduced the industry's first 386-based PC. That's how we consistently break through to new levels of PC performance. And most importantly, that's how we earned our sterling worldwide reputation for delivering the ultimate in power, compatibility and reliability. At every level.

Turn the page and see for yourself. Not only will you see the one 386 line that simply works better. You'll see which PCs in that line simply work better *for you.*

One line that simply works

Key Features and Options	COMPAQ DESKPRO 386N	COMPAQ DESKPRO 386S
Product Class	Low-profile desktop	Small desktop
The User	For the user who needs 386SX performance and requires specific network features	For the general business user considering 286 personal computers
Microprocessor Clock Speed	32-/16-bit 386SX 16-MHz	32-/16-bit 386SX 16-MHz
Coprocessors Supported	16-MHz 387SX	16-MHz 387SX
Expansion Slots Available Type	3 (2) 8-/16-bit ISA (1) high-speed memory	5 (4) 8-/16-bit ISA (1) high-speed memory
Standard Memory Maximum Memory	1 MB 16 MB	2 MB 13 MB
Storage Capabilities 3 1/2-inch Diskette Drive	1.44-MB standard	1.44-MB standard, second optional
5 1/4-inch Diskette Drives	1.2-MB optional	1.2-MB optional 360-Kbyte optional
Standard Fixed Disk Drives	40-MB	84-MB 40-MB
Optional Fixed Disk Drives *Fixed Disk Expansion Unit only. **Supported in Model 1 only.	120-MB 60-MB 40-MB 20-MB	Fixed Disk Expansion Unit (Model 300) 320-MB** 84-MB 300-MB* 40-MB 110-MB 20-MB
Maximum Storage Capacity	120 MB	1.2 GB
Tape Drives (Optional)	N/A	150-/250-MB, 80-/120-MB, or 60-MB
Operating Systems MS-DOS and MS OS/2 are available from Compaq	MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386	MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386
Display (Optional)	Video Graphics Color Video Graphics Monochrome	Advanced Graphics Color Video Graphics Color Video Graphics Monochrome
Video Controllers	Video Graphics (standard) 640 × 480 graphics 720 × 400 text 132-column text support	Video Graphics (standard) 640 × 480 graphics 720 × 400 text Advanced Graphics 1024 (optional) 1024 × 768 graphics 720 × 400 text
Keyboard	Enhanced Keyboard	Enhanced Keyboard
Dimensions	15.0"W × 14.9"D × 3.9"H (38.1cmW × 37.8cmD × 9.9cmH)	15.8"W × 14.8"D × 5.9"H (40.1cmW × 37.5cmD × 14.9cmH)
Additional Options ‡U.S. and Canada.	2400-Baud Internal Modem‡	2400-Baud Internal Modem‡

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better for all 386 users.

COMPAQ DESKPRO 386s/20	COMPAQ DESKPRO 386/20e	COMPAQ DESKPRO 386/25e	COMPAQ DESKPRO 386/33L
Small desktop	Small desktop	Small desktop	Fully expandable desktop
For the general business user who requires more performance and features in a mainstream 386SX personal computer	For the advanced productivity user who needs the right combination of performance and features	For the experienced user who needs superior capabilities and power	For the performance-sensitive user requiring the ultimate in 386 performance and expandability
32-/16-bit 386SX 20-MHz with 4K Cache	32-bit 386 20-MHz with 32K Cache	32-bit 386 25-MHz with 32K Cache	32-bit 386 33-MHz with 64K Cache
20-MHz 387SX	20-MHz 387 or Weitek 3167	25-MHz 387 or Weitek 3167	33-MHz 387 and 33-MHz Weitek 3167
4 (4) 8-/16-bit ISA	5 (4) 8-/16-bit ISA (1) 32-bit memory	5 (4) 8-/16-bit ISA (1) 32-bit memory	7-8 (7) 8-/16-/32-bit EISA (1) 32-bit memory
2 MB 16 MB	4 MB 16 MB	4 MB 16 MB	4 MB 100 MB
1.44-MB standard, second optional	1.44-MB standard, second optional	1.44-MB standard, second optional	1.44-MB standard, second optional
1.2-MB optional 360-Kbyte optional	1.2-MB optional 360-Kbyte optional	1.2-MB optional 360-Kbyte optional	1.2-MB optional 360-Kbyte optional
120-MB 60-MB	110-MB 40-MB	120-MB 60-MB	650-MB 320-MB 120-MB
Fixed Disk Expansion Unit (Model 650 & 300) 650-MB* 120-MB 300-MB* 60-MB 210-MB 40-MB	Fixed Disk Expansion Unit (Model 300) 320-MB** 84-MB 300-MB* 40-MB 110-MB 20-MB	Fixed Disk Expansion Unit (Model 300) 320-MB** 84-MB 300-MB* 60-MB 120-MB 40-MB 110-MB	Fixed Disk Expansion Unit (Model 650 & 300) 650-MB 210-MB 320-MB 120-MB 300-MB* 420-MB Drive Array Pair 240-MB Drive Array Pair
2.6 GB	1.2 GB	1.2 GB	2.6 GB
150-/250-MB, 80-/120-MB or 60-MB	150-/250-MB, 80-/120-MB or 60-MB	150-/250-MB, 80-/120-MB or 60-MB	320-/525-MB, 150-/250-MB or 80-/120-MB
MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386	MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386	MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386	MS-DOS, MS OS/2, Novell NetWare, Microsoft LAN Manager, Banyan VINES, SCO UNIX/386
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Enhanced Keyboard	Enhanced Keyboard	Enhanced Keyboard	Enhanced Keyboard
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Frontier Justice

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Somewhere between your keyboard and computer screen lies a region where personal freedom bumps heads with courtroom justice. It's the frontier of software design, and it's attracting the attention of PC programmers, who worry that copyright rulings and user-interface patents might cramp their freedom to create new products that could benefit us all. And just as in the frontier days of old, these electronic pioneers find themselves facing powerful money interests and even the U.S. government itself.

Don't Fence Me In

There's no doubt that software developers' freedom to adapt and improve on the work of other programmers is being hemmed in by a mounting pile of copyright laws and software patents. Lotus's recent courtroom victory against Paperback Software effectively buried the once-popular notion that only a program's actual code was copyrightable, not its look and feel. Likewise, in the last few years, the government has reportedly issued more than 2000 software patents, some of which cover trivial details like how a cursor displays on a screen or how a dialog box works.

Programmer reaction to these developments ranges from polite concern to downright horror. At a recent computer-science conference, a poll revealed that over 80 percent of attendees supported neither copyright nor patent protection of their software's look and feel. And a group called the League for Programming Freedom has picketed Lotus headquarters twice recently, demanding that the company call a halt to legal efforts aimed at protecting its ownership of the *1-2-3* interface.

According to the league's founder, MacArthur Fellow Richard Stallman, software copyrights and patents will eventually make it impossible for small-time, independent developers to bring out new products, since they'd have to conduct expensive legal searches to ensure their products didn't infringe on any patents or copyrights. Shareware would be another casualty, says Stallman, largely because patent holders wouldn't be likely to grant licenses to developers who couldn't ensure payment for each and every copy of software in the hands of users.

Too Busy to Fight

But what happens when developers don't—or can't—use the law to protect their proprietary interest in a user-interface design? I recently posed that question to Fred Gibbons, president and CEO of Software Publishing Corporation. SPC is a fast-growing, $140 million company with a slew of hits like *Harvard Graphics, First Choice,* and *Professional File;* the company pioneered the distinctive user interface that made its *PFS* family of products a hit with novice computer users.

In 1985, though, SPC was a struggling, $37 million software firm facing a downturn in the software market and a new competitive threat from Symantec's *Q&A*, an easy-to-use data base that adapted and improved on the characteristic SPC interface.

"After *Q&A* came out, I immediately started getting calls from dealers asking me what I was going to do about it," Gibbons recalls. "We had just spent six months doing test panels and focus groups identifying the best design for menus—20 man-months of effort in all. Details like the menu names and screen placement were critical to the intuitiveness we were striving for, and it was agony for me to see someone take advantage of our investment. But I concluded that a lawsuit would have tied up my staff for a year or more, and we needed to innovate our way out of our troubles. In retrospect it was a healthy decision."

Symantec CEO Gordon Eubanks sees it somewhat differently. "We felt then and feel now that there was tremendous innovation in *Q&A*. We made it possible for people who knew the *PFS* products to also use our product. But there were fundamental differences in our products that made us succeed.

"The interesting thing to me today is that the law seems to discount the value of user preferences for a certain inter-

(continues)

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face approach. I'm not sure that serves the public interest. The law should protect you from obvious clones, but a company that recognizes the investment customers made in an overall approach should have some freedom to use what has become a de facto standard."

Innovate or Litigate?

Copyright and patent laws were originally designed to encourage a flow of good ideas to the public by making sure inventors felt properly rewarded for their hard work and financial risk taking. Programming activists like Stallman insist that some dramatic action like a Supreme Court ruling or a new legal mandate from Congress is needed to recapture the law's intent.

But there's nothing in the law that says software developers must sue each other over similarities in software look and feel just to gain a momentary upper hand in the market. Resistance to that impulse has allowed at least two World Class Award–winning products to thrive in a crowded software field—*Harvard Graphics* and *Q&A*. If SPC's experience is any guide, developers can simply heed a well-worn bit of advice: Just say no.

PC World—Your PC Resource

PC World's editors extend a special welcome to the subscribers of *PC Resource*, who join the *PC World* reader community beginning with this issue. We're committed to providing you with a blend of information that's unique in the computer magazine field—the latest PC-related news, hard-hitting product comparisons, practical help for your favorite business applications, and consumerist support to guide you through the maze of promises that vendors make and sometimes break.

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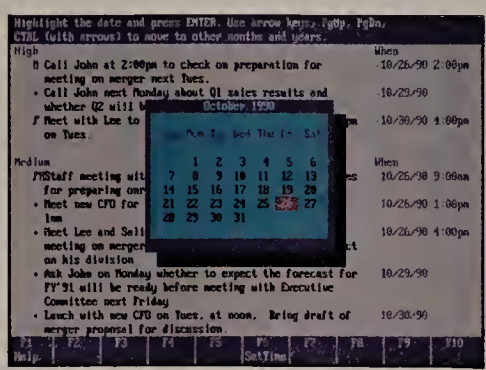

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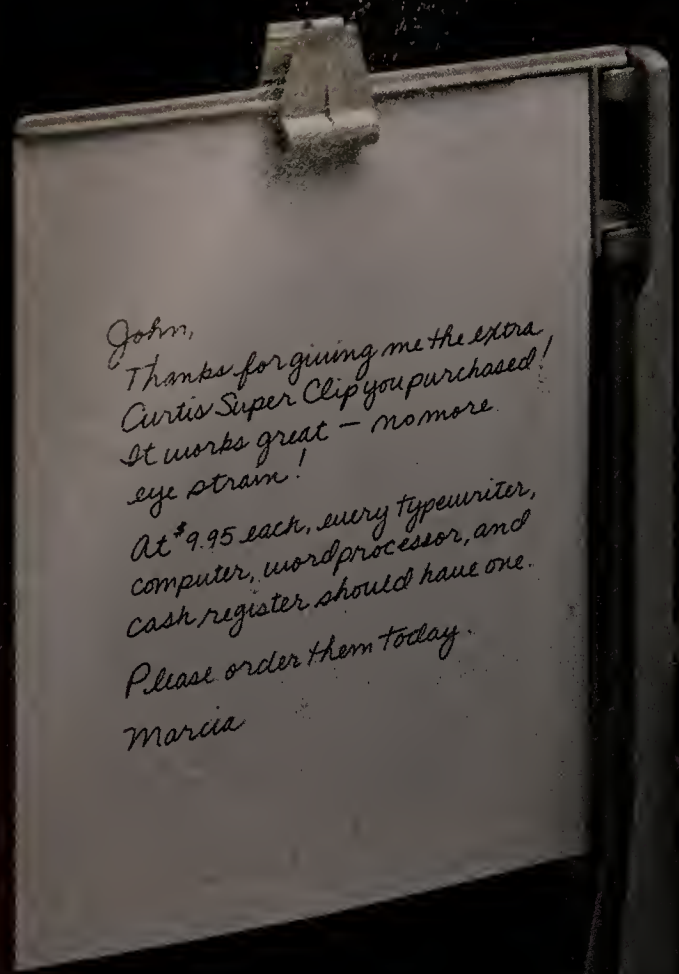

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LETTERS

Reactions and responses from the PC World community

NICK WILTON

Living With Windows

Richard Landry's July column ["Why Windows Won't Go Away"] reminded me of why I read *PC World.* Even sophisticated buyers sweat out the budget! But I took your advice and purchased hardware capable of handling OS/2—even though it's not fully developed. While *Windows 3.0* finally offers a good graphical environment, your recounting of its slow development holds out hope for a usable OS/2. Meanwhile, our employees will be trained as they use the productive *Windows* environment. I've been following your buying advice for some time, and I haven't been sorry yet.

Kenneth G. Nagel
Chicago, Illinois

ANTHONY RUSSO

A Special Issue

I commend you on July's special software issue. It was the most useful issue of a computer magazine that I've run across in years. Thanks as well for not drawing that invisible line between commercial software and shareware. The quality of many shareware packages is indisputable, and I agree with those who insist that users play by the rules and pay the registration fee for shareware they decide to use.

Edwin S. Gleaves
Nashville, Tennessee

A Better Coprocessor?

The heading "SX Miscalculation," which appeared above Darrel Bartelheimer's June letter, seems apt. His performance claims regarding coprocessor-equipped 386SXs and 286s don't jibe with my experience. Midrange 286 machines running Intel coprocessors may be slow—the fastest Intel 80287 runs at 10 MHz and lacks some of the 80387's math functions. But an IIT-2C87 contains all the 387 instructions, runs at full processor speed and is currently priced lower than the 20-MHz 387DX. There are valid reasons to purchase a 386SX rather than a fast 286, but sheer speed in DOS applications is not one of them.

Dan Hackett
Oak Park, Illinois

From Romania With Love

Thank you for publishing my letter in June. I'm deeply touched seeing so many people responding to my call and offering their help. Having such support, I decided to organize an educational PC club. We're facing a severe lack of equipment...but you can surmount difficulties when you have so many friends all over the world.

Radu Ionut
str. A. Vlaicu, nr.11
2700, Deva
Romania

Windows 3.0 Yeas and Nays

I read your July article on *Windows 3.0*—and based on my personal experiences with version 3.0, it looks like *Windows* has finally lived up to the promises made about earlier versions. I can now take advantage of version 3.0's more icon-oriented operation to set up a Task List for grouping *Windows* applications into different categories, which makes loading them much easier. Color support is vastly better—with the right video adapter, you can actually display 256 colors at 640-by-480 resolution. Sure, the program can stand a few improvements, but Microsoft should be proud—all that hype was worth it.

Raymond Chuang
Mountain View, California

I have *Windows 2.1* on my 286, and I've been waiting a long time for *Windows 3.0.* I haven't ordered my upgrade yet, but after a limited performance trial in real mode with *PageMaker 3.0* on a 33-MHz 386, my initial impression is that *Windows 3.0* is full of features but little improved in speed. I've seen claims of performance improvements, but I'd like to see thorough, quantitative tests of the old and new versions of *Windows.*

Arthur Hopkins
Seattle, Washington

The only problem I have with *PC World* is that you devote an inordinate amount of space to *Windows.* I understand that version 3.0 is a great improvement, but I

(continues)

tried all the earlier versions of *Windows 386* with distinct increases in my blood pressure. They worked fine—with *Windows* applications only. Because of this, I removed *Windows 386* from my hard drive and now use Quarterdeck's *Desqview 386* to provide a multitasking environment.

R. A. Walsh
New York, New York

BackUps and Downs

I read "No-Excuses Backup Software" in July, and although I think *PC Tools Deluxe* deserves your high rating, I feel you missed a point. To restore a blank, formatted hard disk, you need the backup program on a floppy disk. Unfortunately, *PC Tools Deluxe*'s PC Backup won't run from a floppy, so the complete program has to be reinstalled before restoring. Some other programs, such as *Fastback Plus*, will run from a floppy, which can be conveniently included with the backup disks.

Joe Pentecost
Atlanta, Georgia

I agree that *PC Tools Deluxe* is an excellent all-around tool, but when you match it against software written specifically for a particular job, it can't measure up. Norton is new to the backup game, and its backup utility has some shortcomings, as you noted—I've been using *Fastback* for six years, and to rate *Norton Backup* above it is a joke. *Fastback Plus* backs up hidden files and directories and allows for restoring particular files just by entering them. If you wish to include or exclude more than 20 choices of files or directories, maybe backing up isn't what you had in mind, and you should use COPY or XCOPY instead.

Steve Schafir
Miami, Florida

Disk Technician Omission

I enjoyed "Disk Trouble? No Thanks!" in July, but I was amazed that you omitted Prime Solutions' *Disk Technician Advanced*. From experience, I know that *Disk Technician* is a superior hard disk utility that does things as valuable as the programs you *did* review, and then some. Why did you omit it?

Al E. Rubottom
San Diego, California

A major criterion of selection for this review was the ability to handle DOS partitions greater than 32MB. At this writing, Disk Technician *doesn't do so.*
—Michael Goodwin, associate editor

Shell Cracks

After reading "Making DOS Manageable" in July, I don't think that you gave *XtreePro Gold* a fair shake. You neglected to mention its most important feature: the fine context-sensitive help. It has excellent mouse support, and even without a hard drive, I can run it on my laptop. I've tried several other DOS shells, and *XtreePro Gold* is by far the best.

Rocky L. Hurley
Asheboro, North Carolina

I was excited by your reports on DOS

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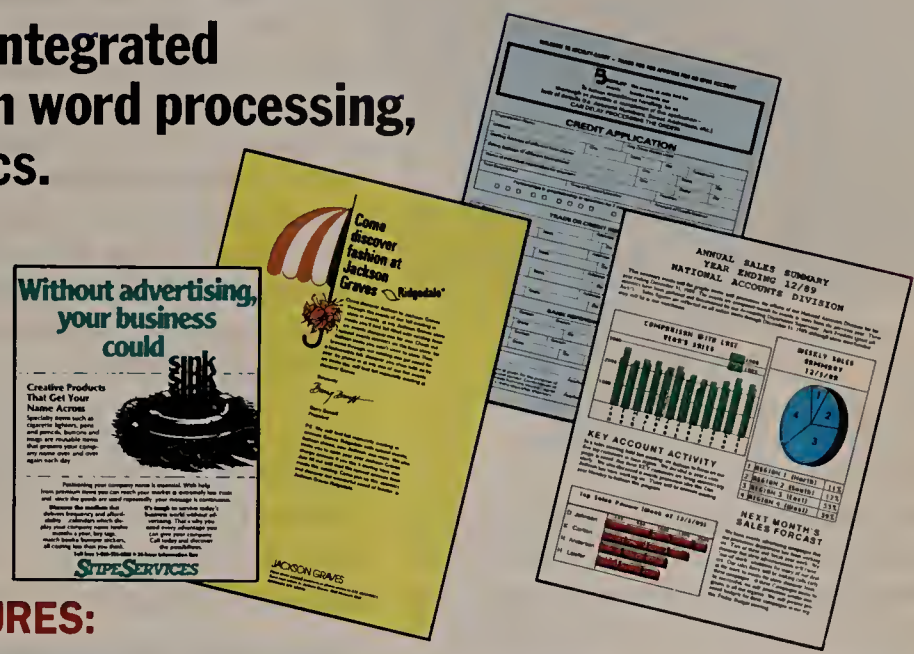

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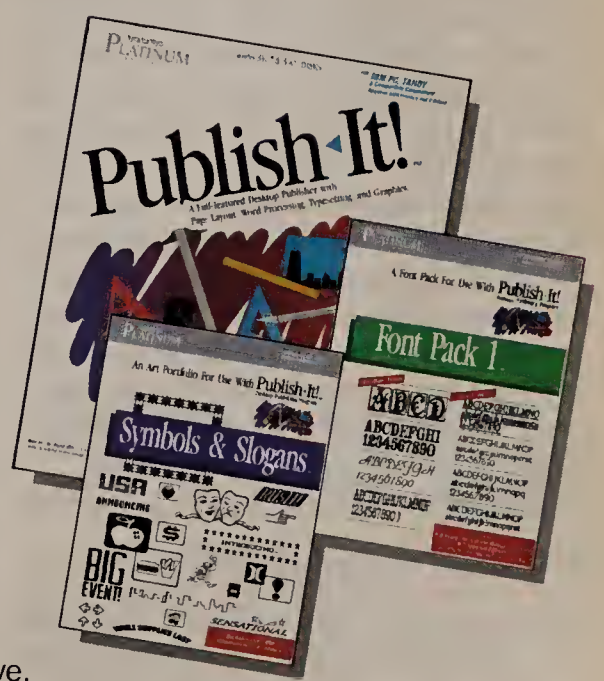

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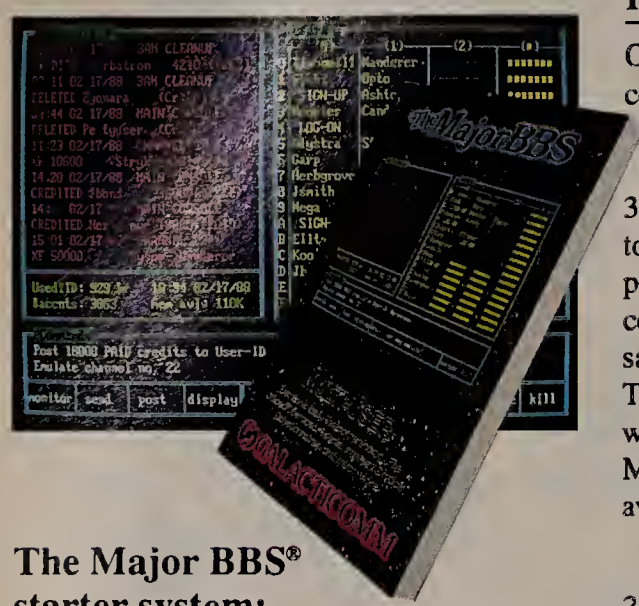

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The Major BBS Standard Edition ..... $ 59

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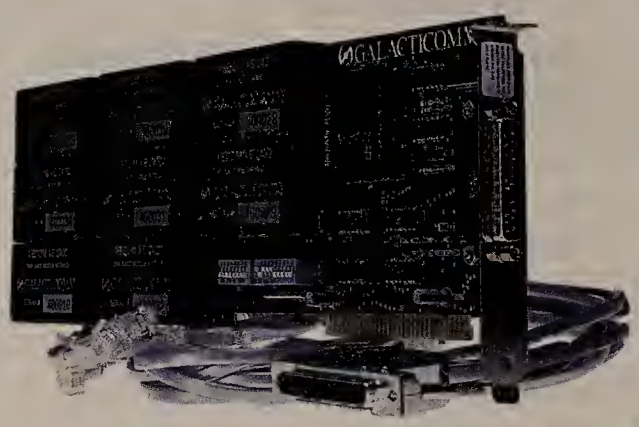
No LAN or multi-tasking OS necessary! Double the number of simultaneous users that your system can support, from 2 to 4, or 4 to 8, or any number up to 64 simultaneous users on a single CPU, for a flat $300 software license fee per doubling. The upgrade process is quick, automatic, and fully upward-compatible — i.e. you can install an update or upgrade onto your existing system without disrupting any of your user account files, E-Mail messages, configuration variables, or any other aspect of your system. For up to 16 users, 640K RAM is sufficient; above 16 users, more than 640K may be necessary. Prerequisite: The Major BBS (any edition).

Users, per doubling (up to 64) ..... $ 300

If you need multi-modem hardware:

Our Model 2408 consists of up to 8 Hayes-compatible modems on a single circuit card, for the PC/XT/AT/386/486 family. Each modem operates independently at 300/1200/2400 bps (automatically switching to match the caller's bps rate). Built-in serial ports are not COM-port based, so this card can co-exist with other COM port hardware in the same machine (drivers for software other than The Major BBS are not included but may be written). RJ-11 telephone cables are included. MNP Class 4 (error correction) modems are available as an option.

	non-MNP	*MNP Class 4*
2408 w/2 modems	$ 1536	$ 1696
2408 w/4 modems	$ 2090	$ 2388
2408 w/6 modems	$ 2644	$ 3080
2408 w/8 modems	$ 3198	$ 3772



When you're ready for source code:

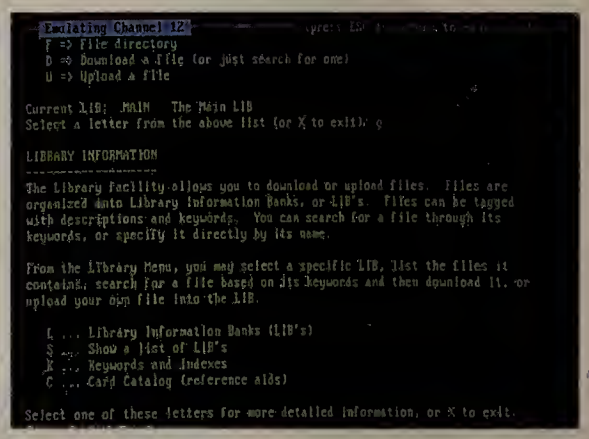
With the C source code to The Major BBS, you can add 3rd-party software, such as The Major Database (a general-purpose, configurable database manager), various multi-player real-time adventure games, dial-out utilities, global command utilities, accounting enhancements, and much more. Also, you can maintain your own copy of the BBS, or you can modify it to suit your own unique requirements. The Major BBS C source code package is fully documented, and it includes the Galacticomm Software Breakthrough Library, plus all of the utility object libraries, linker control files, and DOS "batch" files you will need, along with a detailed Programmer's Guide. Works with Turbo C 1.5, 2.0, or 2.01, Turbo C++, or Microsoft C 4.0, 5.1, or 6.0. Prerequisite: The Major BBS Standard Edition.

Standard Edition C source code ..... $ 285

For the ultimate in *file transfer flexibility:*

The File Library Edition of The Major BBS has everything that the starter system does, plus built-in ZMODEM, KERMIT, Super-KERMIT, YMODEM-g, and YMODEM (batch) file transfer protocols. Also, it offers super-fast pre-indexed keyword file searches, library-wide searches as well as constrained searches, special file upload/download accounting options, alternate DOS "paths" per sub-library, split paths for CD-ROM support, a transparent "DOS-only" sub-library option, and much more. This package is for you if the focus of your system will be the upload and download of large amounts of files. You can easily upgrade from the starter system to the File Library Edition, without losing any of your data files or configuration work you have already done. Prerequisite: The Major BBS Standard Edition.

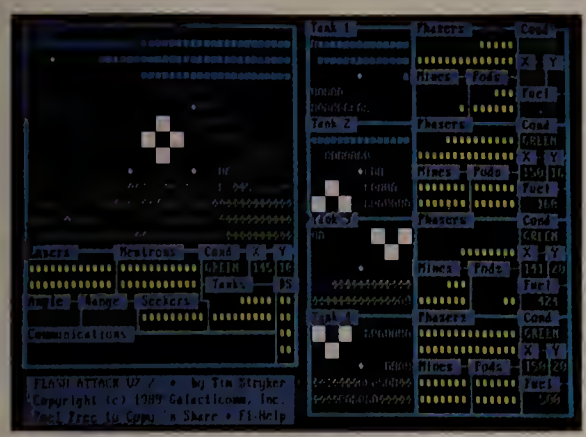
File Library extensions ..... $ 199
*File Library C source extensions** ... $ 159



If you decide to offer *online games and amusements:*

The Entertainment Edition of The Major BBS has everything that the starter system does, plus Quest for Magic (a multi-player interactive text adventure game), Androids! (a multi-player arcade-style ANSI-graphics game), Flash Attack (a futuristic tank and laser battle for multiple players with IBM PC's), and the Action Teleconference Link-Up, which includes private "chambers", action verbs (grin, wink, nudge, etc.), the ability to link to other systems for huge multi-system teleconferences, custom entry/exit strings, user-configurable profiles, and much more. This Edition supports the Flash™ Protocol (where most of the game functionality is on the user's

end of the phone line), for which dozens of incredible new multi-user games are now being developed. Upgrading from the starter system to the Entertainment Edition is quick



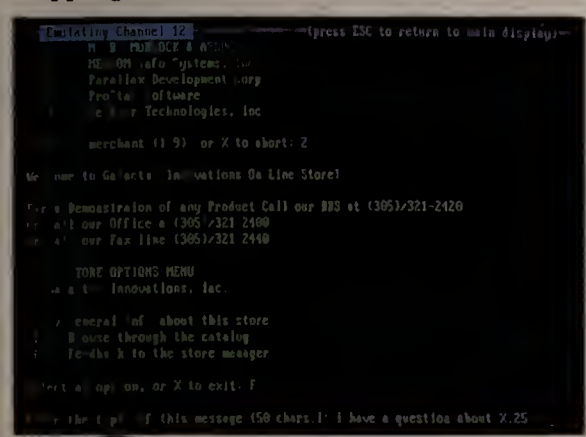
and easy and involves no loss of data or function. Prerequisite: The Major BBS Standard Edition.

Entertainment extensions ..... $ 149
*Entertainment C source extensions** .. $ 129

If your requirements include *order entry and catalog sales:*

The Shopping Mall Edition of The Major BBS has everything that the starter system does, plus online shopping. Your online mall can have multiple "stores", each run by its own separate "merchant", if desired. Each merchant has control over his or her own product line, pricing, discount structure, store welcome message, sales tax handling, etc. Also, each merchant may create up to 6 different payment methods (e.g. VISA, MC, AMEX, C.O.D., "bill me", etc.), and up to 6 different shipping methods (e.g. UPS, FedEx, US Mail, etc.), each with its own rates (flat rate, percent of sale, 1st-ounce/add'l-ounce, or 1st-pound/add'l-pound). Users may browse product catalogs at no obligation, or order products and services directly online! Orders generate invoices that are posted to the individual merchant as attachments to E-Mail. To upgrade from the starter system to the Shopping Mall Edition takes only a few minutes. Prerequisite: The Major BBS Standard Edition.

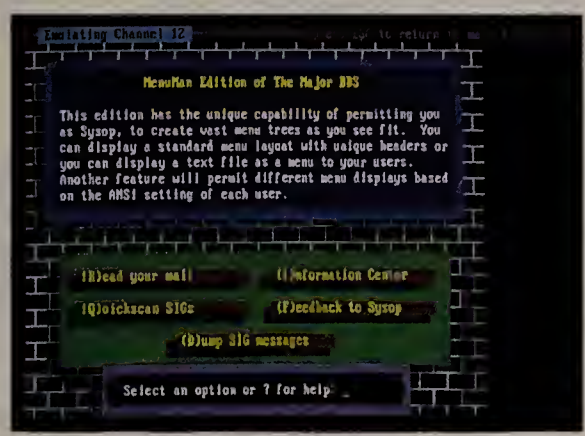
Shopping Mall extensions ..... $ 249
*Shopping Mall C source extensions**. . $ 189



For super-flexibility of *menu trees and ANSI screens:*

The MenuMan Edition of The Major BBS can do everything that the starter system does, and in addition you as Sysop can create your own menu trees, with menus leading to menus leading to menus, as deeply "nested" as you like. The "leaves" of your menu trees can be ordinary ASCII or ANSI files, which are simply dumped to the user's display (with or without automatic screen breaks), or they can be any of the built-in functions of the BBS such as scanning the user's incoming E-Mail or firing up a SIG quickscan. Includes commands like *GO <pagename>*, *FIND <topic>*, *USERS*, and for the Sysop, the equivalent of the DOS commands *DIR*, *RENAME*, *COPY*, *DEL*, *MKDIR*, and *RMDIR*, as well as a set of privileged commands for editing and extending the menu trees, remotely, while the BBS remains fully online. Upgrading from the starter system to the MenuMan Edition takes only minutes. Prerequisite: The Major BBS Standard Edition.

MenuMan extensions ..... $ 149
*MenuMan C source extensions** .... $ 129



As your system grows larger...

The GalactiBox™ is our 16-slot "expansion chassis", for large-scale systems. It has the unique ability to address individual modems by slot number rather than just COM port address, so you can use up to 16 standard internal modems in it, side by side, without conflict. Includes built-in 150W power supply, interface card for your XT/AT/386/486, cables, and full documentation. Up to 4 boxes may be attached to one CPU, for a total of up to 64-channel expansion capacity. Prices shown below are for standard 300/1200/2400 bps Hayes-compatible internal modems. We also have 9600 bps V.32/V.42 MNP Class 5 modems available, call for prices.

GalactiBox (unpopulated) ..... $ 1992
GalactiBox w/4 modems ..... $ 2416
GalactiBox w/8 modems ..... $ 2840
GalactiBox w/16 modems ..... $ 3688

...and that's not all! For advanced applications, we also offer an X.25 direct-connect software option, a protected-mode development toolkit, and special licensing arrangements for up to 256 simultaneous users! And don't forget the smorgasbord of 3rd-party add-ons available, such as The Major Database from Galactic Innovations. Custom programming and integration services are also available. Your system can grow in power and sophistication, far into the future, with The Major BBS.

Here's How To Order:

Just dial (305) 583-5990 and say, "I'd like to place an order!" We can generally ship your order within 48 hours. We accept major credit cards, or we can ship C.O.D. Prices shown do not include shipping or insurance.

For more information, you may either call the main order number and ask for a sales engineer, or dial (305) 583-7808 with your modem (8-N-1) for a free demo of most of our products. This demo system also contains an online Shopping Mall with many of the 3rd-party add-ons available for The Major BBS, operated by the 3rd-party vendors themselves.

Give us a call today!

The Major BBS, Flash Protocol, and GalactiBox are trademarks of Galacticomm, Inc. PC, PS/2, XT, AT, and PC-DOS are trademarks of International Business Machines Corp. Hayes is a trademark of Hayes Microcomputer Products, Inc. The Major Database is a trademark of Galactic Innovations, Inc. Turbo C and Turbo C++ are trademarks of Borland International, Inc. MS-DOS and Microsoft C are trademarks of Microsoft Corp. UPS is a trademark of United Parcel Service. FedEx is a trademark of Federal Express Corp. MNP is a trademark of Microcom, Inc.

**The C source code extensions are necessary, if you wish to combine multiple extended Editions together, or add 3rd-party software, or develop your own modifications. Prerequisites, in each case, are the Standard Edition C source code, and the corresponding extended Edition.*

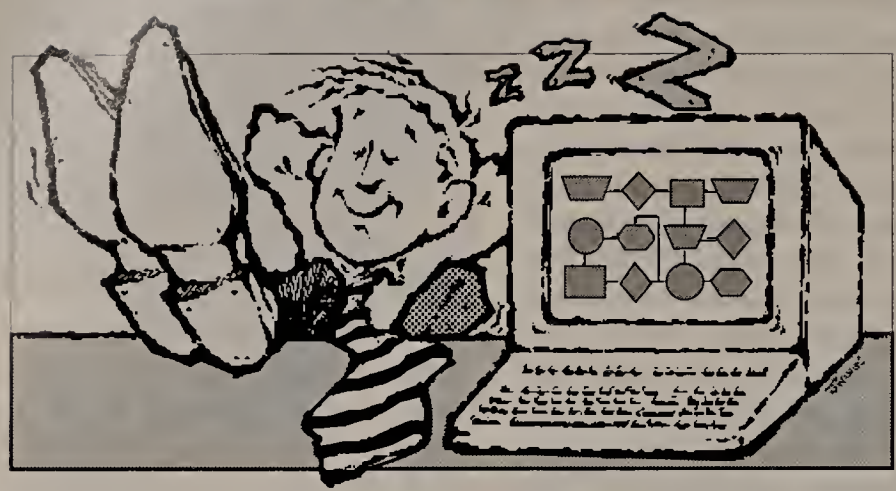
GALACTICOMM

Galacticomm, Inc. 4101 S.W. 47 Ave.
Suite 101, Fort Lauderdale, FL 33314

Modem: (305) 583-7808
Fax: (305) 583-7846
Voice: (305) 583-5990

Circle 63 on reader service card

Shh!



Don't tell your boss about EasyFlow!

Don't say how much time you saved on flowcharts and data flow diagrams. **EasyFlow**, unlike most "screen draw" programs, is dedicated to fast composition and modification of flowcharts and data flow diagrams.

Don't breathe a word about the automatic line routing, automatic text centering, the slick cut & paste or how you created charts and then cleanly moved them into a desktop publishing program. Tell your boss you had to sweat bullets to come up with these amazing results.

Don't point out that **EasyFlow** works with most matrix printers, laser printers and plotters.

Keep the 200 page manual out of sight. Don't get caught with one of the 350 context sensitive help messages on your screen.

Don't let the boss know that **EasyFlow** only costs $149.95 and that RUSH delivery is available.

Do tell the boss you are a hard working genius but don't mention the other 80,000 geniuses whose bosses don't know either.

EasyFlow

Flowcharting Made Easy.

HavenTree Software Limited

P.O. Box 1093 - M Thousand Island Park, NY 13692

Order Desk: 1-800-267-0668 Info: (613) 544-6035 ext.47

Fax: (613) 544-9632

From our fax to yours... Info Fax: (613) 544-2049

Circle 79 on reader service card

management products in July. But I found a mistake in the Features Evaluation on page 121: *PC Tools Deluxe* does provide file viewing of *Paradox* files. I use that function of *PC Tools* every day.

Brian Culberson
Atlanta, Georgia

Finding the Bulletin Board

Your July issue, which was enjoyable and informative, said that Peter Norton Computing has a CompuServe BBS. I couldn't find it, but after getting E-mail help from your staff, I worked out a solution. At a CompuServe prompt, type **go pcvena**, press **<Enter>**, and follow CompuServe's instructions from there.

Bill Lyons
Atlanta, Georgia

Tip Slip

Here's a correction to Power Tip No. 109, "Quick Totals for 1-2-3," printed on page 58 of the July issue. The tip de-

(continues)

POWER TIP NO. 132

Printing Windows 3.0 Colors in Black and White

Printing colorful graphics on black-and-white printers doesn't work very well—true colors print as lifeless black blobs. You can avoid this problem by changing the Luminance value of custom colors to a value between 180 and 210. Open the Color utility from the Control Panel. Select *Color palette Define custom colors*. Select your defined colors, and choose an appropriate hue. Your custom colors will now print as gray dot patterns—not a perfect solution, but better than basic black.

Brian Livingston
New York, New York

After everything you've heard about Windows Computing, there are only two things you should believe.

Windows™ C

Free Working Model

Your

See for yourself. With Windows™ Computing, using your PC becomes easier, faster, and more productive than you ever imagined possible. But you don't have to take our word for it. Because, right now, we're making fully functional Working Models of Microsoft® Windows version 3.0, Microsoft Excel, Project, Word and PowerPoint® presentation graphics program as easy to get a hold of as they are to use.

Windows Computing is the Windows version 3.0 environment combined with any of the hundreds of Windows applications already available.

Just pick up the phone and call (800) 323-3577, Dept. M73, and we'll

*The first Working Model you select is free during our Windows Computing Promotion, September 15 through December 31, 1990. One free Working Model per person. Each additional Working Model is $9.95, applicable sales tax not included. Offer go

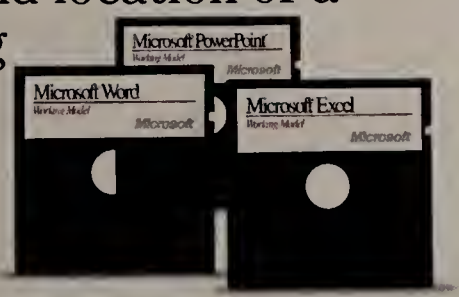
omputing

Microsoft®

eyes.

send you a free copy of the Working Model* you're most interested in.

Or, if you would prefer, just ask for the date, time and location of a Windows Computing seminar being held near you. Either way, the experience is sure to impress you.



The truth is, we believe there could be only one reason why people might not see just how much Windows Computing means to the future of the personal computer.

They haven't looked.

Microsoft®

Making it all make sense™

last and only in the 50 United States. ©1990 Microsoft Corporation. All rights reserved. Microsoft, PowerPoint and the Microsoft logo are registered trademarks and Making it all make sense and Windows are trademarks of Microsoft Corporation.

The question is not "do you need a network?"; the question is "what kind of network do you need?"

If your company has more than one computer, connecting them together is either an immediate concern or soon will be. There are numerous connectivity methods available. The choice your company makes will directly affect you. Want to discover the most appropriate connectivity method for *your* needs? It may be a surprise.

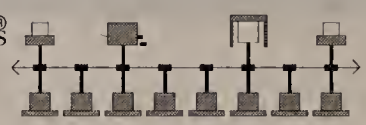
Check off the capabilities you need:

- ☐ *1. Share access to one or more printers or plotters*
- ☐ *2. Share access to a modem*
- ☐ *3. Exchange electronic mail and messages with other users*
- ☐ *4. Electronically transfer data files between computers (rather than pass diskettes)*
- ☐ *5. Access a common library of data files, like drawings, document templates, memos, boilerplate, etc.*
- ☐ *6. Access a common database, where multiple users must access the same records simultaneously (e.g. an order entry system)*

If you checked any or all of the first five capabilities listed above, but not number six, your company does ***not*** need a full-blown LAN. This news can save your company a lot of money and make life much simpler for everyone concerned. Skip to the next paragraph immediately. If you selected the sixth capability, a data-sharing LAN is needed, but only for those users who must access the shared database. To achieve the other capabilities, your best—and most economic—solution is...

Systemizing™ - The Sensible Network

Heard of it? Over 50,000 people use Systemizers® every day—and have for over four years—at many of the world's largest organizations.



Systemizing is an alternative (or supplement) to a LAN. It's a connectivity method that works with practically every computer in existence—ranging from PCs to mainframes—regardless of brand, model, operating system (DOS, UNIX, PICK, etc.), or application. You can Systemize without putting any hardware or software inside your computers. To quote one customer: "It's the most sensible solution to connectivity I've ever encountered!"

Do yourself and your company a favor, call our toll-free number and ask for our ***Systemizing Demo.*** The demo alone is widely praised as "incredible".

For a free desktop demo, call:

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(or fax your request to 1-214-696-3925)

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scribes a macro to place a dashed line and an @SUM() function beneath a column of numbers. The instruction as printed wouldn't work. This does: "Enter the label '\-{down}@sum({up}.{end}-{up})~ in an out-of-the-way cell." The other directions in the Power Tip work fine.

CC Landry
Metairie, Louisiana

This letter and others we received provide workable corrections, although the original tip would have worked had not a typesetting slip added a space between '{END}' and '{UP}'.

Power Tips are a part of PC World that you write.

Letters like this one demonstrate that our readers really put Power Tips to use. And since they come from you, they are, along with this forum, the part of PC World *that you write. So if you have developed a technique for increasing PC productivity, share it—you can earn $25 or more on publication, and you'll see your name in* PC World. *Send Power Tips to* PC World, *Editorial Department, 501 Second St. #600, San Francisco, CA 94107, c/o Power Tips. —Ed.*

Corrections and Clarifications

A June *Top of the News* item, "WordPerfect Joins Alliance," erroneously stated that WordPerfect president Alan Ashton owns the majority of WordPerfect stock.

In our Features Evaluation for "No-Excuses Backup Software" in July, the subcategory heading "Backs up to all floppy media" is misleading. Actually, the reviewed programs back up to all standard 3½- and 5¼-inch floppy media.

To send correspondence, please see How to Contact PC World, page 4.

In Redondo Beach, California . . .

You'll find breathtaking ocean views, sensational surfers and Gateway 2000 computers.

Dive 'N Surf, famous for Body Glove® fashions and watersports equipment, is a member of the growing family of Gateway 2000 customers in California. Dive 'N Surf Computer Systems Manager Graham Pask chose a Gateway 25 MHZ 386 machine for his network server. The system runs point-of-sale, inventory control, word processing and desktop publishing software.

Graham Pask, Computer Systems Manager for Dive 'N Surf, and his Gateway 2000 25 MHZ 386 network server.

"I decided to buy a Gateway 2000 system because they had everything I wanted for a good price," said Graham. "But what really impressed me was the service. I had a problem with my 3 1/2 inch drive so they sent me a new drive the very next day."

Graham said he was so happy with his Gateway system at work that he bought a Gateway 2000 25 MHZ 386 Cache machine for his home.

Until well after sunset, surfers ride the big waves on the Pacific Ocean near Redondo Beach, California.

And In Barrow, Alaska . . .

Over 300 miles north of the Arctic Circle, you'll find polar bears, seals, whales, walrus, lemmings, snowy owls and what appear to be the largest mosquitoes in existence. On a summer afternoon you'll also see parka-clad tourists walking among local residents in shorts. And of course you'll find a good Mexican restaurant and Gateway 2000 computers.

Jeff Frier, Cape Smythe Air Service, with his Gateway 2000 386SX.

Cape Smythe Air Service, a regional commuter airline serving Barrow, Kotzebue, Nome and remote villages in Alaska, has one of several Gateway 2000 computers operating in Barrow. Jeff Frier, Cape Smythe's accountant, chose a Gateway 2000 386SX to run spreadsheet, data base and accounting applications.

"I was trying to decide between Gateway 2000 and a competitor," Jeff commented, "so I talked to a person who owns the competitor's system. He was disgruntled about the service he received from them. Then I talked to another person in Barrow who has a Gateway and she was happy with the product and service. The choice was pretty obvious -- when you're doing business in a remote area, the most important things a vendor can offer are reliability and good service."

Jeff said he also appreciated Gateway's features and price. "When you have to pay $6 a gallon for milk, it's nice to find a bargain somewhere." Jeff plans to buy another Gateway 2000 computer in a few months .

On a mid-July day in Barrow, Alaska, fishing boats weave in and out of icebergs on the Chukchi Sea.

In Bradford, Pennsylvania . . .

You'll find a charming small city nestled in the Allegheny National Forest. The city's most prominent local business is the Zippo Manufacturing Company, where you'll find 18 Gateway 2000 computers in use.

Fred Gronemeyer, Zippo Manufacturing Company, and his Gateway 2000 20 MHZ 386 system.

Zippo is known around the world for its windproof lighter made famous during the second World War, although today the company's product line includes many other specialty advertising items. Fred Gronemeyer, Systems Analyst for Zippo, chose Gateway 2000 as the company's standard PC.

"We needed to set standards for PC's and software to make the most efficient use of these tools," Fred remarked. "We started out with PC's from different manufacturers, but once I tried Gateway I was convinced we could get the highest quality, most reliable machines at the best price from Gateway 2000. I was also impressed by my salesman and the tech support people I've dealt with at Gateway."

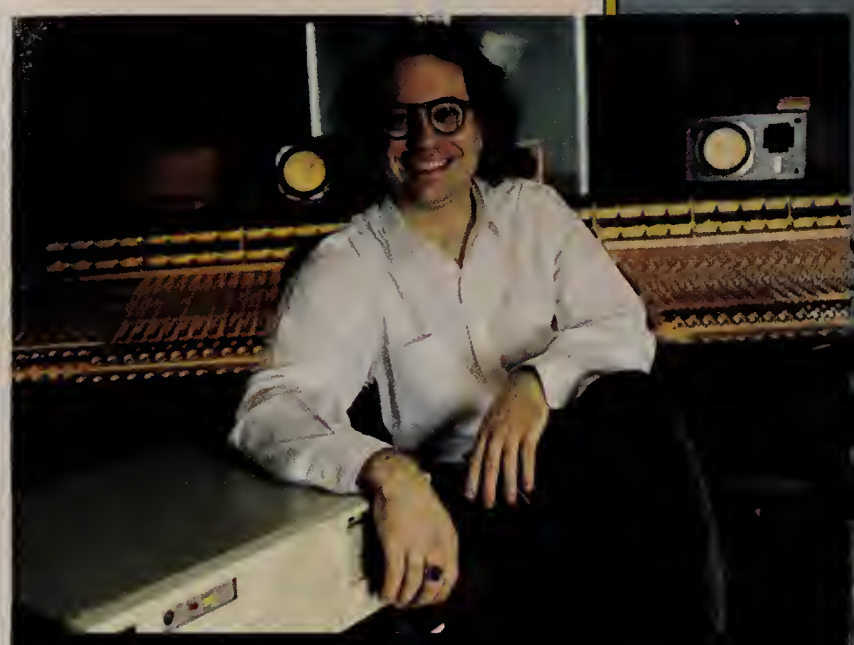
Fred said by the end of the year Zippo will be running every system Gateway 2000 makes, from 286's up to a 486 and everything in between.

Main Street, U.S.A., is located in Bradford, Pennsylvania.

And In New York City . . .

You'll find your senses overwhelmed by the countless sights and sounds of this one-of-a-kind city. And of course you'll find thousands of Gateway 2000 computers here.

One New York City Gateway 2000 owner is



Jim Rondinelli, independent record producer and engineer, with his Gateway 2000 386SX.

independent record producer and engineer Jim Rondinelli. Jim uses his Gateway 2000 386SX with a sophisticated player piano sequencer to compose music.

"The software I use is written for the Mac and for IBM compatibles," Jim said, "but it runs much better on IBM compatibles. And it runs best of all on my Gateway. I travel often and I've used my software on a lot of other machines. They don't even compare with my Gateway 2000."

Jim said he bought his Gateway 2000 because it was equipped for the real world with ample hard drive capacity and RAM, both sizes of disk drives and color VGA graphics.

"It's the fastest file transfer computer I've ever used," continued Jim, "plus it ran right out of the box. One afternoon and I was fully functional on a brand new system."

The streets of Manhattan are a constant blur of activity.

Near Camp Verde, Texas . . .

You'll find the magnificent Hill Country of Texas with rattlesnakes, prickly pear cactus and huge cattle ranches. You'll also find Larry Mahan and his Gateway 2000 computer.

Larry Mahan is to rodeo what Jack Nicklaus is to golf. He is Six Times World Champion All-Around Cowboy and is a member of the Cowboy Hall of Fame. But Larry also runs a cattle and horse ranch and is involved in a western apparel manufacturing company and a new Southwestern foods company. His Gateway 2000 20 MHZ 386 system is an integral part of his business operations. "We run cow and calf software for our Longhorn cattle herd," Larry said. "You can't really manage a livestock business efficiently without it. Plus we do accounting, spreadsheets and word processing on our Gateway 2000 computer."

Larry Mahan, rodeo star, and his Gateway 2000 20 MHZ 386 system.

Asked why he chose Gateway 2000, Larry said, "They had the best features and price – and I thought a computer company that puts pictures of cattle in their ads had to be my kind of people. And I was right. The people I've talked with at Gateway 2000 are honest-to-goodness nice folks. It's a pleasure doing business with them."

Larry Mahan raises registered Texas Longhorn cattle.

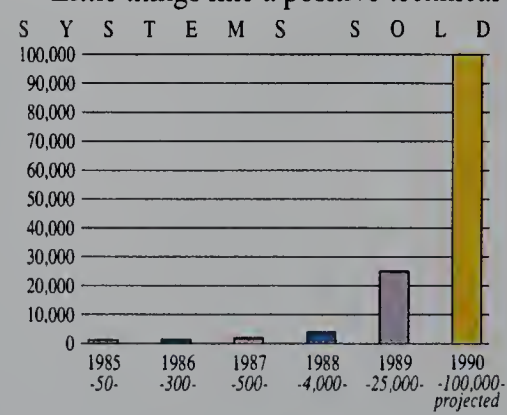
Across The Country You'll Find

You'll find so many Gateway 2000 computers in so many places today because people everywhere know a good value when they see one. In all 50 states and in over 70 foreign countries, thousands of people are comparing prices, quality and service – and choosing Gateway 2000.

But value alone doesn't explain how a little company in the Midwest, started just five years ago, managed to outdistance hundreds of other companies, selling more systems through the direct market channel today than any other PC manufacturer in the country.

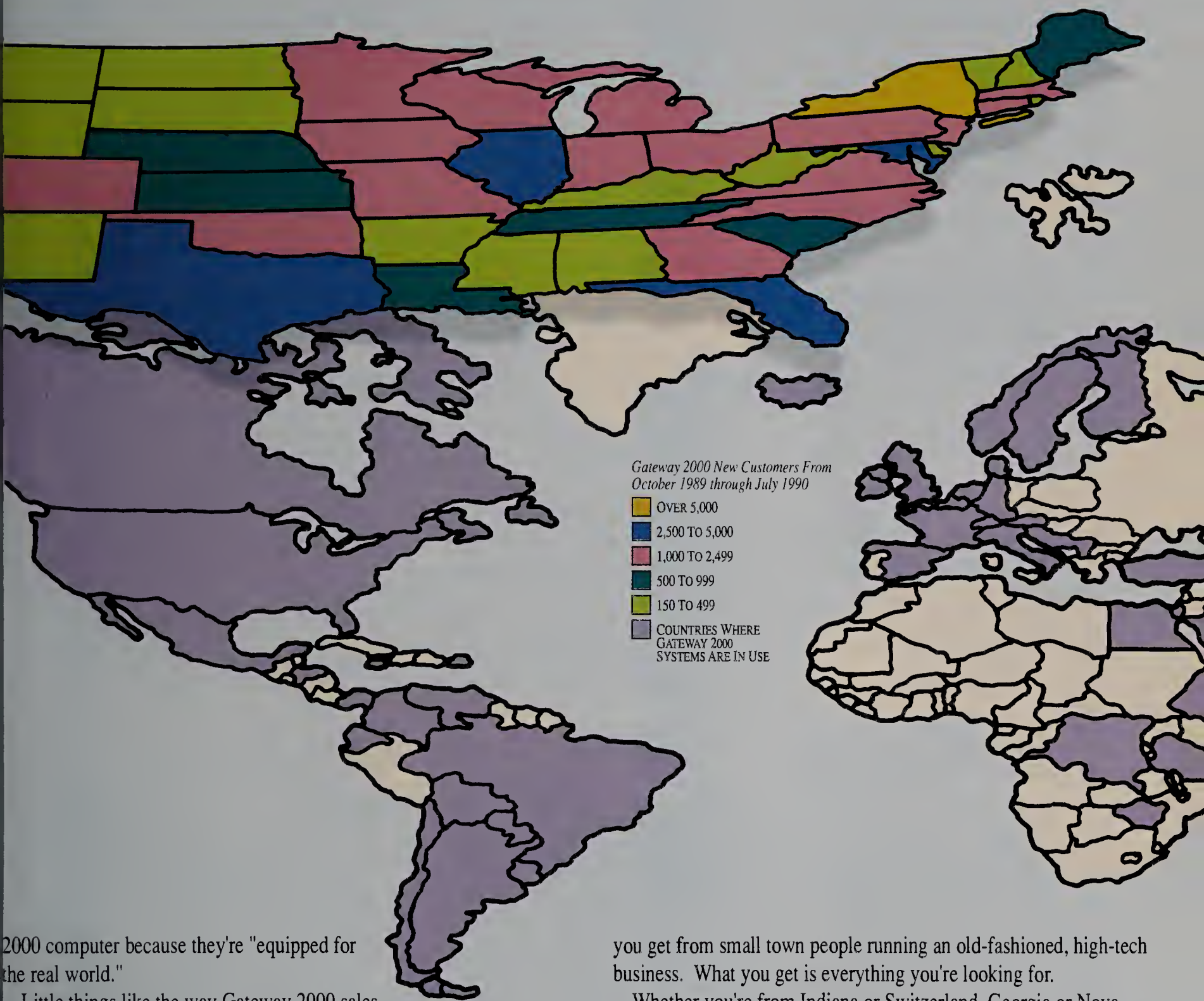
The explanation is that the company has always maintained a small company attitude. With Gateway 2000, you still get the little things you'd expect only from a small firm.

Little things like a positive technical support department. When Graham Pask told his Gateway 2000 tech rep that his 3 1/2" drive didn't work, he received a new drive the very next day.



Little things like the way Gateway 2000 systems are fully loaded with all the features you want. Jim Rondinelli bought a Gateway

AND AROUND THE WORLD, GATEWAY 2000!



2000 computer because they're "equipped for the real world."

Little things like the way Gateway 2000 sales people develop excellent business relationships with their customers. Fred Gronemeyer tried his first Gateway because he was impressed by his sales person. Eighteen systems later, Fred is still impressed by his sales person.

And the biggest little thing of all is the feeling you get when you deal with the people at Gateway 2000. As Larry Mahan said, "they're honest-to-goodness nice folks."

Compare prices, quality and service. Then add up the little things you get from small town people running an old-fashioned, high-tech business. What you get is everything you're looking for.

Whether you're from Indiana or Switzerland, Georgia or Nova Scotia, you've got a friend in the business at Gateway 2000.

GATEWAY2000

"You've got a friend in the business."

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GATEWAY 2000 SYSTEMS

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- 80286-12 Processor
- 2 Megs RAM
- 1.2 Meg 5.25" Drive
- 1.44 Meg 3.5" Drive
- 40 Meg 28ms IDE Drive
- 16 Bit VGA with 512K
- 14" 1024 x 768 Color Monitor
- 1 Parallel & 2 Serial Ports
- 101 Key Keyboard
- MS DOS 3.3 or 4.01

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GATEWAY 386SX

- 2 Megs RAM
- 1.2 Meg 5.25" Drive
- 1.44 Meg 3.5" Drive
- 40 Meg 17ms IDE Drive
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THE HELP SCREEN

PC World offers answers and advice at every level

Set up applications for Windows 3.0, use wild cards to select files, set up your system to run programs unattended, swap printer ports, and contemplate the cost of linking remote networks.

Karl Koessel

Program Icons in Windows 3.0

Q. *I recently installed a new program on my hard disk. To set it up for* Windows 3.0, *I double-clicked the* Windows Setup *icon and selected* Options Set up applications. Windows *searched the disk but didn't recognize my program.*

Curious, I looked more closely at the application setup utility and noticed that it ignored a few other programs on my hard disk. Can you explain this and tell me how to make a PIF file and an icon for my application?

Roger Thompson
Santa Monica, California

A. The Set Up Applications utility searches the hard disk for program files that match those listed in its internal tables. It can't set up applications it doesn't know about. By default it looks for EXE, not COM or batch files, and it looks only at the file's name (not its contents), believing a matching name identifies a program it knows. However, you can easily set up applications yourself.

You must, of course, first install the application on the hard disk, complete with any necessary drivers, support files, and/or changes to your PATH command. Then read the documentation to learn whether the program is started by running a COM, EXE, or BAT file.

Now run *Windows*, and in the Program Manager window, open (or create) the program group in which you want the new application's icon to appear. Select *File New Program item OK* to bring up the Program Item Properties dialog box. Type in a short description (which will appear just below the icon), and press <**Tab**> to move to the Command Line box. At this point you can either click the Browse button and navigate through the directories to locate the start-up file or type the drive, complete path, name, and extension of the file that starts the program. (For example, if you were identifying *Excel*'s start-up file, EXCEL.EXE, and had installed the application in a directory named \EXCEL on drive C:, you'd enter **c:\excel\excel.exe**.) Press <**Enter**>, and the icon for the new application will appear.

Note that you can create several start-up icons for the same program and place them in different program groups. Also, you can omit the drive and path portion of the Command Line entry if the start-up file's directory is listed in the current system PATH. In that case, you can even use the drive and path that you want to be the default

(continues)

Tame That Hard Disk!

Most software makes it all too easy to store program and data files in the same directory. The result? Big headaches when you need to find important data files, back up subdirectories, or upgrade software. Putting program and data files in separate subdirectories (left) helps keep your hard disk organized and manageable. An even better solution—assuming you have a large enough hard disk—is to create two logical drives (right), one for program files only and one for data files only. Because program files rarely change, you'll usually need to optimize or back up only the logical drive with your data files. Over the course of a year, that can add up to hours of time saved.

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PC WORLD STEP-BY-STEP GUIDE #3

A Parallel Printer–Swapping Utility

This guide shows you how to create a program that swaps LPT1 and LPT2.

LPT1'S DEFAULT I/O PORT ADDRESS

Before creating SWAPLPTS.COM, you need to learn LPT1's default I/O port address. Place in drive A: a disk that contains a copy of DEBUG.COM (from either the DOS Supplemental Programs disk or the DOS Operating disk) and some free space to hold the printer-swapping program. At the A> prompt, type **DEBUG** and press **<Enter>**. Then type **D40:8 L2** and press **<Enter>**. Two pairs of hexadecimal numbers (BC 03, for example) will appear. Write them down on a piece of paper, reversing the order of the two pairs and omitting the space (03BC). Press **Q<Enter>** to quit DEBUG.

THE CODE

Using a line editor or your word processor in ASCII text mode, type the following bold text, pressing **<Enter>** at the end of each line. Type carefully; it's easy to confuse **L**'s and **1**'s and **O**'s and **0**'s.

```
A100
PUSH DS
MOV AX,40
MOV DS,AX
MOV BX,[8]
```

Now type **MOV CX** followed by a comma and the four-character hexadecimal I/O port address that you wrote down during the first step. Press **<Enter>**. Continue with the following columns, pressing **<Enter>** at the end of each line.

```
CMP  BX,CX
POP  DS
JZ   121
MOV  SI,1F4
MOV  BYTE PTR [SI],32
MOV  SI,1FA
MOV  BYTE PTR [SI],31
JMP  12D
NOP
MOV  SI,1F4
MOV  BYTE PTR [SI],31
MOV  SI,1FA
MOV  BYTE PTR [SI],32
SUB  CX,CX
MOV  DX,194F
MOV  AX,600
MOV  BH,16
INT  10
SUB  DL,DL
MOV  SI,1F4
MOV  DH,[SI]
SUB  DH,31
MOV  AH,2
MOV  BH,0
INT  10
MOV  DX,1A0
MOV  AH,9
INT  21
MOV  DX,1F4
MOV  AH,9
INT  21
MOV  DX,1CA
MOV  AH,9
INT  21
MOV  DX,1FA
MOV  AH,9
INT  21
MOV  DX,200
MOV  AH,9
INT  21
MOV  AH,1
INT  21
CMP  AL,79
JZ   178
CMP  AL,59
JNZ  192
PUSH DS
MOV  AX,40
MOV  DS,AX
MOV  BX,[8]
MOV  CX,[A]
MOV  [8],CX
MOV  [A],BX
POP  DS
JMP  100
MOV  AH,4C
INT  21
```

THE REPORT AND PROMPT TEXTS

Press **<Enter>** again to create a blank line, and type the bold text below, pressing **<Enter>** at the end of each line. The number of characters must not change; type a single space between words only where indicated. Note also that there is a space before the final double quotes on the fourth, fifth, and ninth lines. The names *PRINTER_1* and *PRINTER_2* may be replaced by more descriptive monikers (for example, EPSONFX80 and SERIES II) for your printers, but you *must* use exactly the same number of characters, including spaces.

```
E1A0  "The PRINTER_1 pr"
E1B0  "inter is connect"
E1C0  "ed to LPT$The PR"
E1D0  "INTER_2 printer "
E1E0  "is connected to "
E1F0  "LPT$#:.",D,A,"$"
E1FA  "#:.",D,A,"$"
E200  "Do you want to s"
E210  "wap the printers' "
E222  "port assignmen"
E230  "ts? $"
```

Now press **<Enter>** to create a second blank line, and type the following, pressing **<Enter>** as indicated.

RCX<Enter>135<Enter>NSWAPLPTS.COM<Enter>W<Enter>Q<Enter>

Save the file on drive A: as unformatted ASCII text, calling it **SWAPLPTS.DBG**.

DEBUG CREATES SWAPLPTS.COM

At the A> prompt, type **DEBUG <SWAPLPTS.DBG** and press **<Enter>**. This command will "feed" DEBUG the keystrokes stored in SWAPLPTS.DBG, creating SWAPLPTS.COM on the disk in drive A:. Copy the COM file to a directory that's listed in your system's PATH so you can use it whenever you want.

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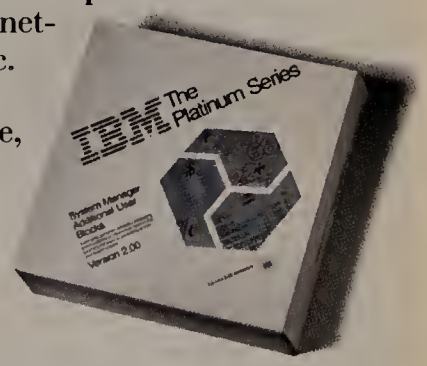

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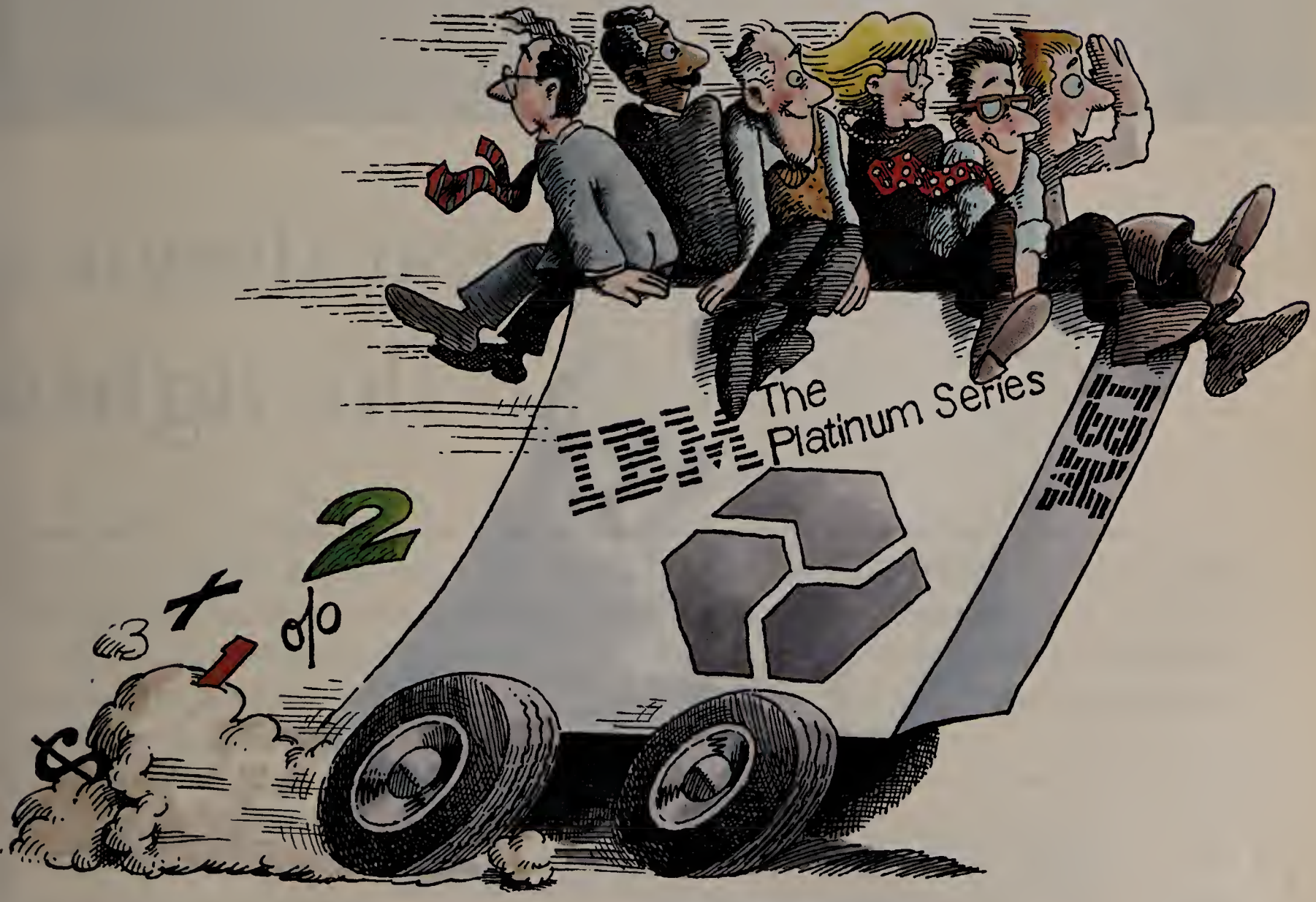

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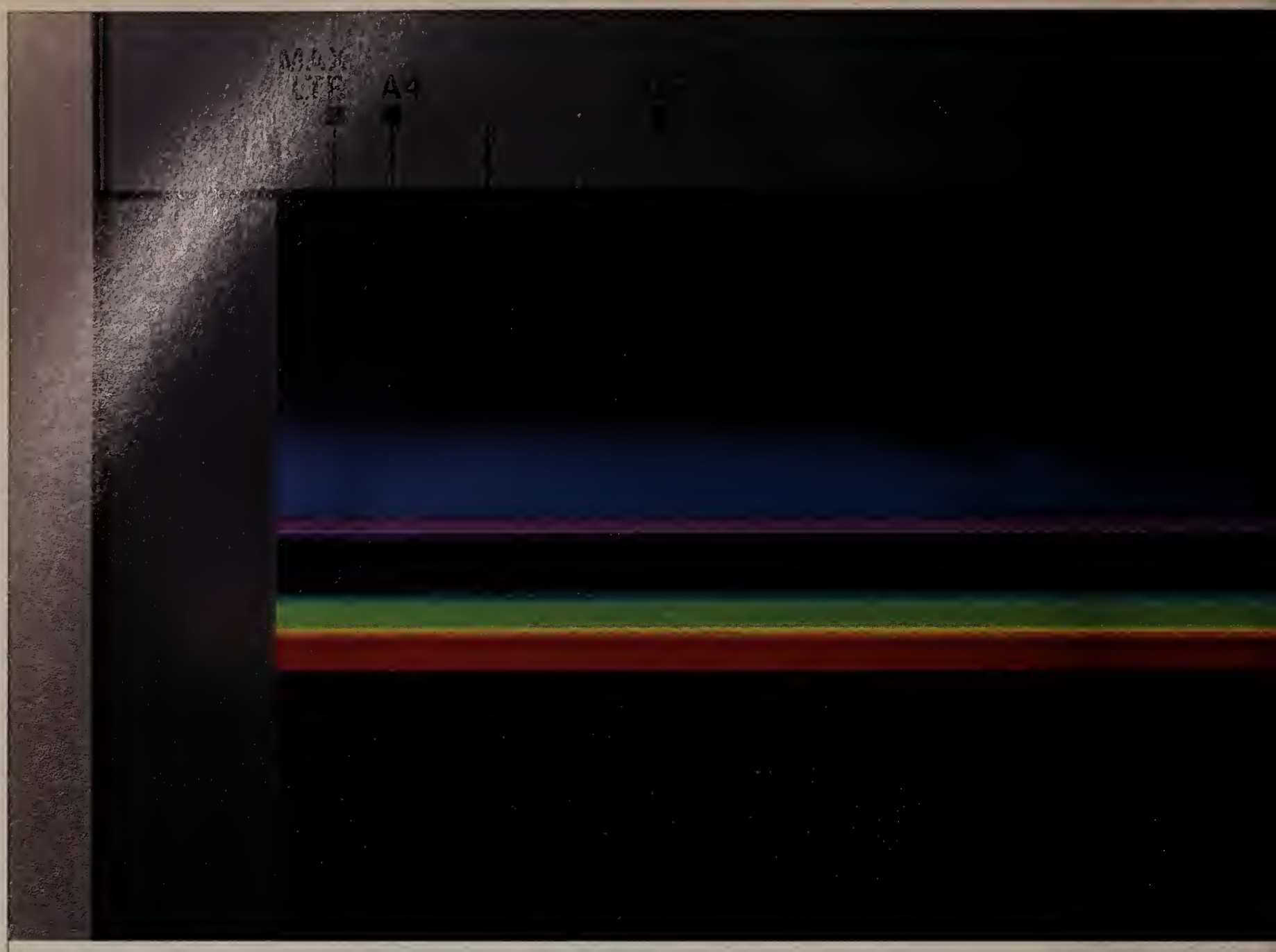

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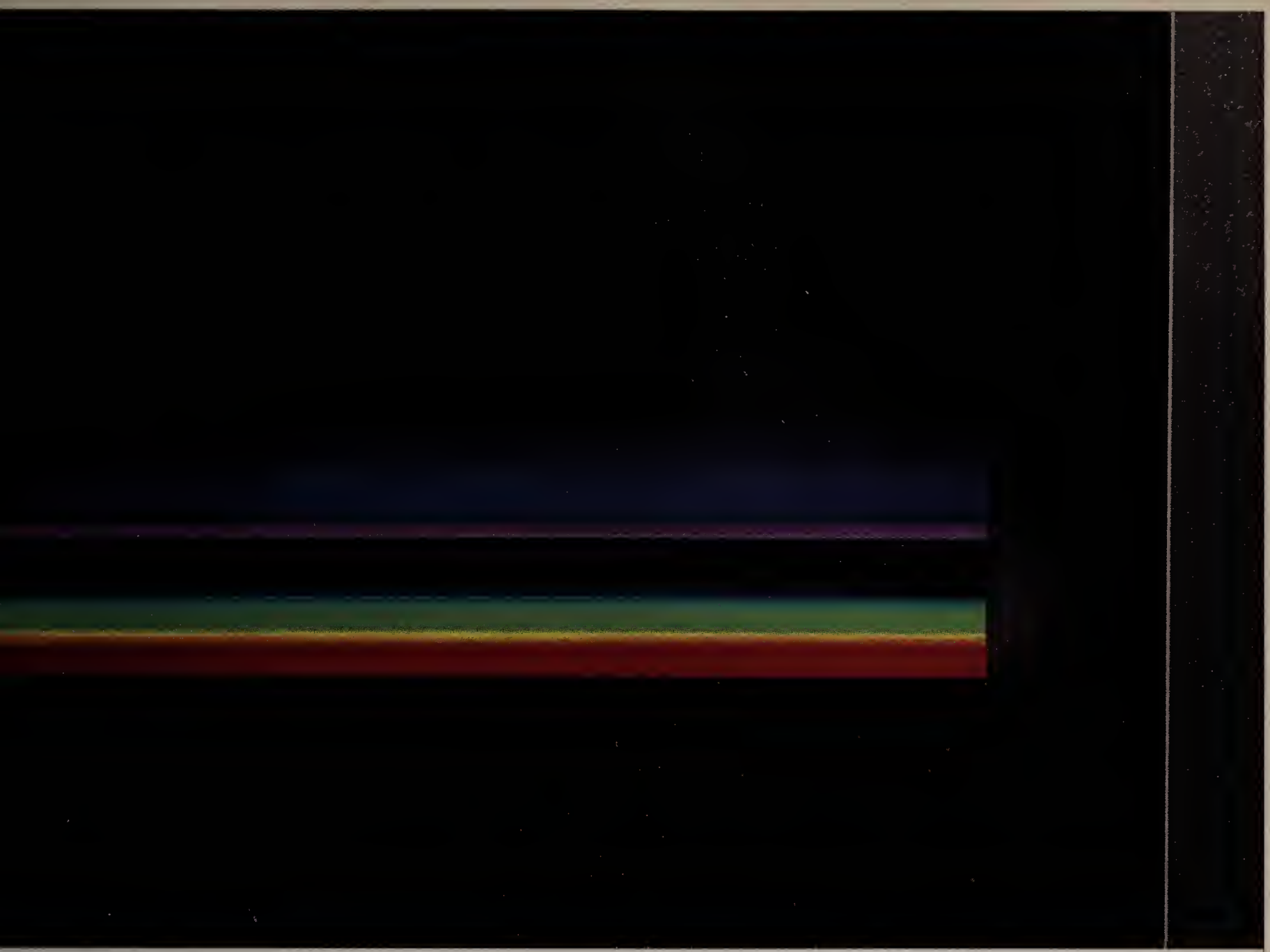

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directory when the application starts. Because *Windows* can't find the start-up file in the specified directory, it will give you a warning message stating that the path is invalid. Just select *OK* to tell *Windows* you want that directory to be the default for this application.

The Wild Side of DOS

Q. *There's probably a simple answer to this question, but I can't figure it out. Suppose that I have the files XX90.WK1, XX89.WK1, QU90.WK1, and QU89.WK1 in a directory, and I want to copy only the files with 89 in their names to a floppy disk. But the command COPY *89.* A: gives me the same results as COPY *.* A:. Why doesn't it work the way I want it to? I thought the purpose of the DOS wild-card character was to make selecting a group of files easier.*

Mark W. Schurmann
Decatur, Georgia

A. DOS has two wild-card characters. The asterisk represents any string of up to eight characters, so COPY *ANYTHING.* A: is the same as COPY *.* A:. You need to use the question mark, which represents any *single* character, as in COPY ??89.* A:. Note that this command will copy files that have any extension, but the file name must consist of exactly four characters with *89* as the third and fourth; it will not copy X89X.WK1 or 89QU.WK1, but it will copy XX89.BAK and ZZ89.WK1. Before you COPY or DEL (ERASE) files using wild-card characters, always issue a DIR command using the wild-card expression (as in DIR ??89.*) to see which files will be selected.

Sleep and Boot

Q. *I need a memory-resident program (TSR) that will automatically reboot a system at a specified time. Our network has a communications server that links us to a mainframe. The mainframe reboots itself automatically at 3 a.m., severing the link to our comm server. We have been manually relinking the comm server, but with a utility that would reboot the comm server at 3:15 a.m., we could automate the process. Can you tell me if there is such a product?*

Norma A. Vasquez
Van Nuys, California

A. You can use *Auto-Might* to schedule up to eight time slots during which a macro of up to 210 keystrokes can run. The activities can be set to occur once, daily, weekly, monthly, or even daily excluding weekends. The scheduled macros can launch batch files, execute DOS commands, or run menu-driven applications.

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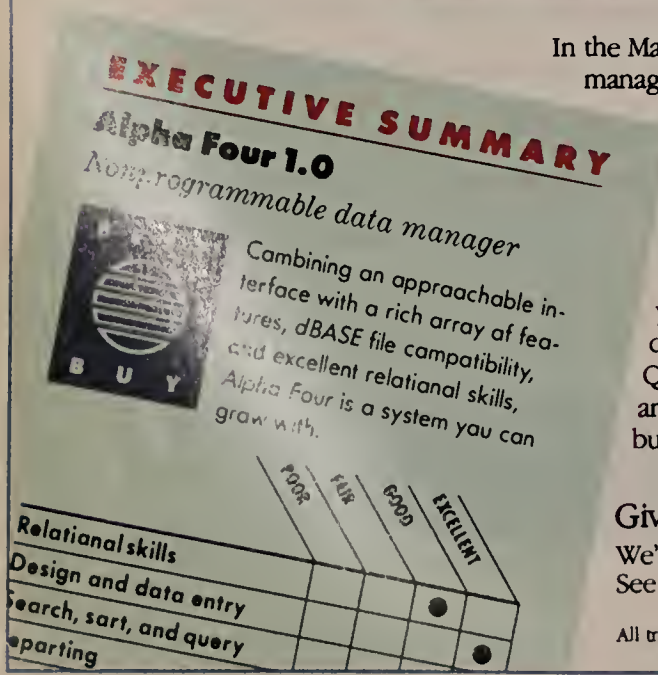

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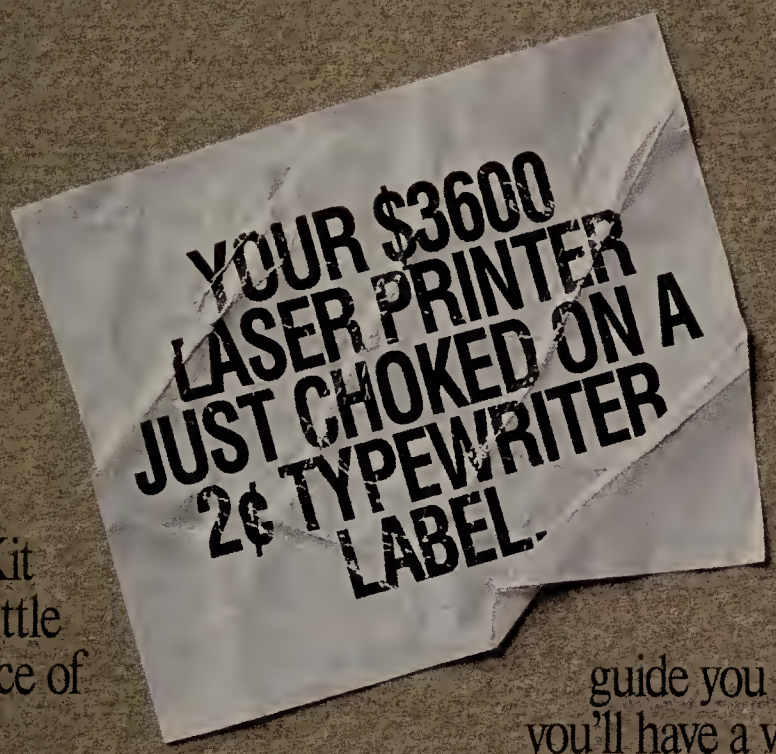

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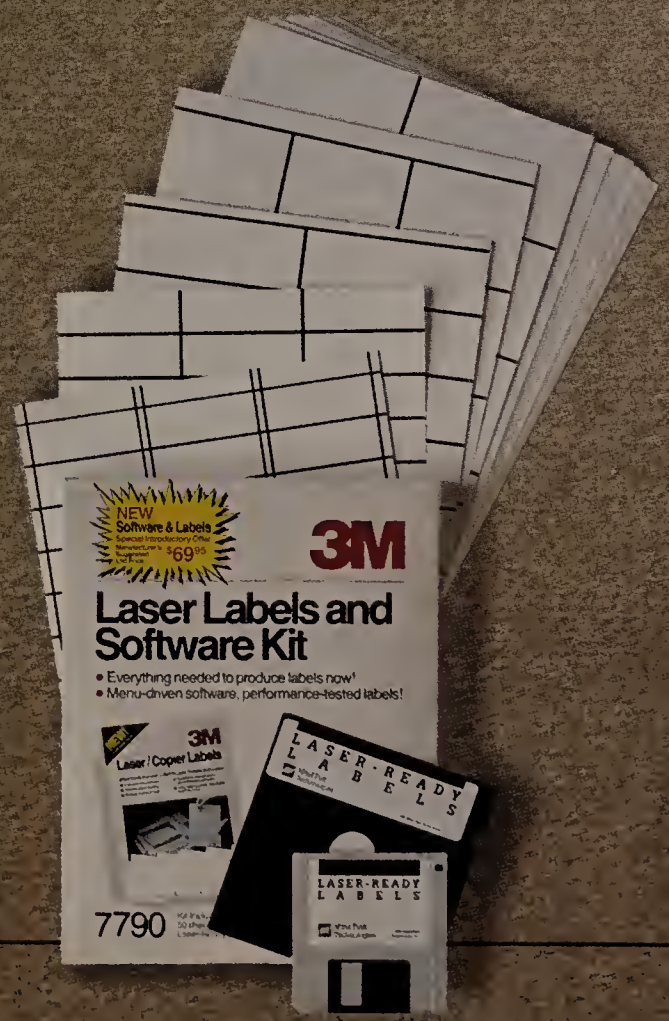

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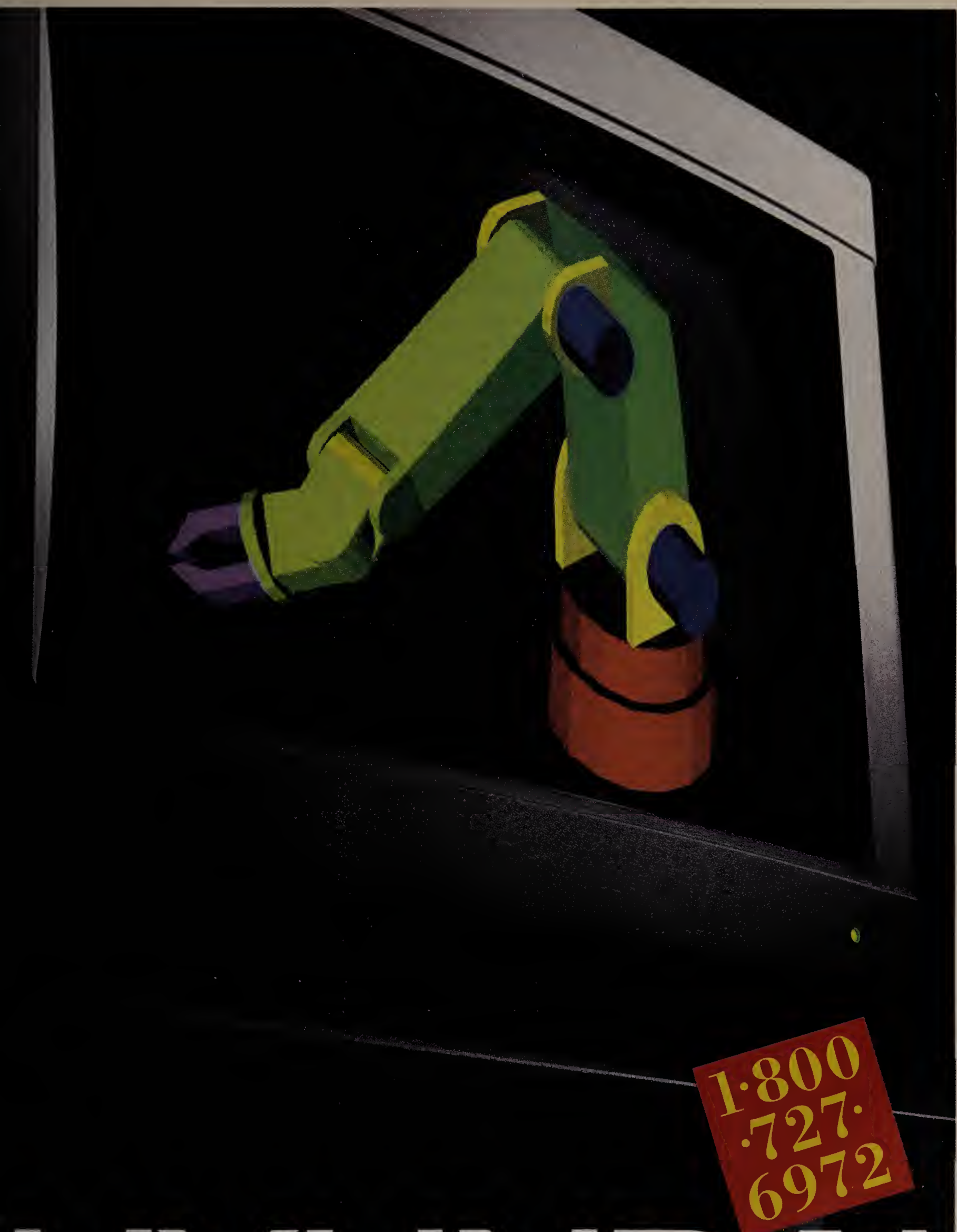

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NETWORK Q&A

T1 Links and Remote Data Base Access

David Ferris

Q. *We have a 30-workstation network at our headquarters in Oakland, California, and a 10-PC local area network (LAN) in our New York sales office. Sales staff periodically need to access up-to-date customer and inventory information located in Oakland using a custom Paradox application. We currently use dial-up lines for E-mail, but I understand we probably need a fast leased data line, known as a T1 link, for data base applications. Is this true, and what will a T1 cost us?*

H. Graves
San Francisco, California

A. You're right—remote data base applications do require a high-speed link (see last month's "Network Q&A"). However, they're expensive; using remote control software, such as Carbon Copy, often works out to be a lot cheaper. You appear to have four options: Use a T1 link, use a "fractional T1" link, download files periodically over a regular phone line, or connect to the LAN with remote control software over a regular phone line.

Most wide area network (WAN) applications such as E-mail work well with line speeds of up to 64 kbps, but remote data base access is an exception. Today's data base management software requires frequent file swaps between workstation RAM and the data base directory at speeds between 1 and 8 mbps. If the directory is remote, clearly you need a fast WAN link.

The T1 Solution. A T1 link is a 1.544-mbps point-to-point connection provided by a common carrier such as AT&T. The carrier installs end wires at both locations, and you install an AT-class machine as a communications server on each LAN. Both servers need a specialized adapter and control software, plus a connection box similar to a modem called a CSU/DSU, to which the T1 wiring is attached. To access inventory information, users simply connect to the remote site using the appropriate LAN operating system commands, map the remote directory to a logical drive, and run Paradox locally.

Installation costs are approximately $9870 for each location: communications server PC $1700; CSU/DSU $1000; network cable and installation $250; network adapter $500; DOS $120; T1 communications adapter and software $6000; T1 line installation $300.

And now for the real kicker—your monthly rental fee for unlimited use of the line. This depends on the distance. For a 50-mile link, you'd pay around $1000 per month. For the 2600 miles between Oakland and New York, the charge would be about $25,000 per month.

Fractional T1. You can rent T1 lines that use slower speeds, such as 768, 512, and 384 kbps. These lines use the same T1 hardware, and monthly charges are about $12,000, $8000, and $7000, respectively. Data base applications will work, although sluggishly, at these slower speeds.

Periodic File Download. Here you transfer your data base files between Oakland and New York only occasionally—perhaps as an E-mail attachment. Remote users then run their data base applications against these local file copies. Later, you transfer file updates back to the central data base. The advantage to this approach is that you can use normal, inexpensive phone lines. However, if you need up-to-date access to a single centralized data base, this approach is not acceptable.

Remote Control. Probably the best method is to let the New York sales staff use terminal emulation to link to a "remote host" PC in Oakland that actually runs their data base application. The host machine needs an asynchronous modem and a dial-up line, plus remote control software such as Carbon Copy, Co/Session, pcAnywhere, Remote2, or Takeover. Any of these packages will work well enough for your application—ask your dealer to demonstrate them so you can see which one you like. Also install the software and modems in the New York PCs that need access to the Oakland inventory data base, and give them telephone lines.

Suitably equipped, each host costs about $3700 list (see "Network Q&A," April 1990). To upgrade a remote PC with a modem and software costs less than $900.

So suppose you need remote dial-up capability for six workstations and two hosts, allowing up to two concurrent dial-in sessions. Also suppose you will use an average of 9 connect hours per business day. Total installation costs will be around $12,800 ($3700 twice plus six times $900). Line charges are around $15 per hour during business hours, amounting to monthly connection fees of $2835.

To sum up, the remote control approach is much cheaper than using T1 or fractional T1 links unless your dial-up charges are very high. For example, for several sales representatives periodically accessing the remote data base,

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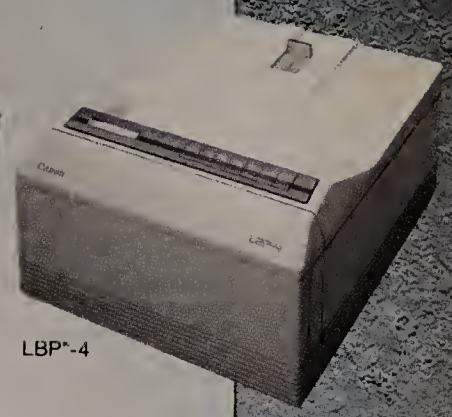

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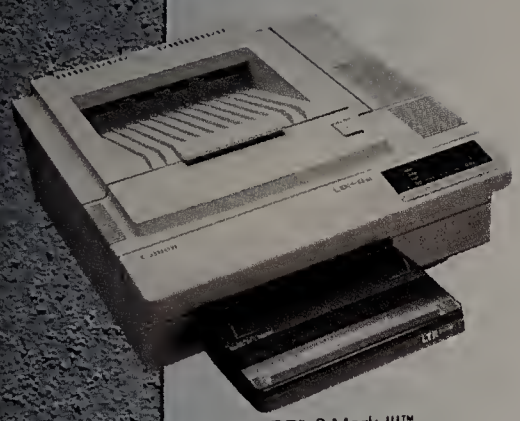

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Best of all, when you buy any Canon Laser Beam Printer from September 1 through December 31, 1990, you'll also get a $195 SC-1™ IC Card, which offers you the added versatility of 22 more scalable fonts. And the charge? Zippo.

So not only is improving your image easier than ever before, it's a lot more economical, too.

Plus, a free driver kit containing all current printer definition files with complete installation instructions for most popular software is also available.

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Some printer functions may require memory upgrade.
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Circle 47 on reader service card

NETWORK Q&A

(continued)

averaging a total of 4 hours per day in communications charges, you would pay roughly $1300 per month for dial-up links versus $25,000 for a T1 link. T1 will start to make sense when you need about ten nonstop lines; chances are, you're a long ways from that. Consider fractional T1s if your monthly dial-up charges creep up to $5000 per month.

David Ferris is president of Ferris Networks, a San Francisco–based consulting firm specializing in networks.

For more information about all products in this item, circle reader service no. 906.

WHERE TO BUY

Carbon Copy Plus
Microcom Software Division
500 Ridge River Dr.
Norwood, MA 02062-5028
800/842-1863, 617/551-1021 (fax)
LIST PRICE: $199
Reader service no. 655

Co/Session
Triton Technologies
200 Middlesex Turnpike
Iselin, NJ 08830
201/855-9440, 201/855-9608 (fax)
LIST PRICE: $249 (for two PCs)
Reader service no. 656

pcAnywhere
Gateway Communications
2941 Alton Ave.
Irvine, CA 92714
800/367-6555, 714/553-1555, 714/553-1616 (fax)
LIST PRICE: stand-alone versions II and III $95 and $145, respectively; network version (NetWare Anywhere) available only through Novell
Reader service no. 657

Remote2
DCA/Crosstalk Communications
1000 Alderman Dr.
Alpharetta, GA 30201-4199
800/241-4762, 404/442-4500, 404/442-4368 (fax)
LIST PRICE: $195
Reader service no. 658

Takeover
SoftKlone
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LIST PRICE: $295
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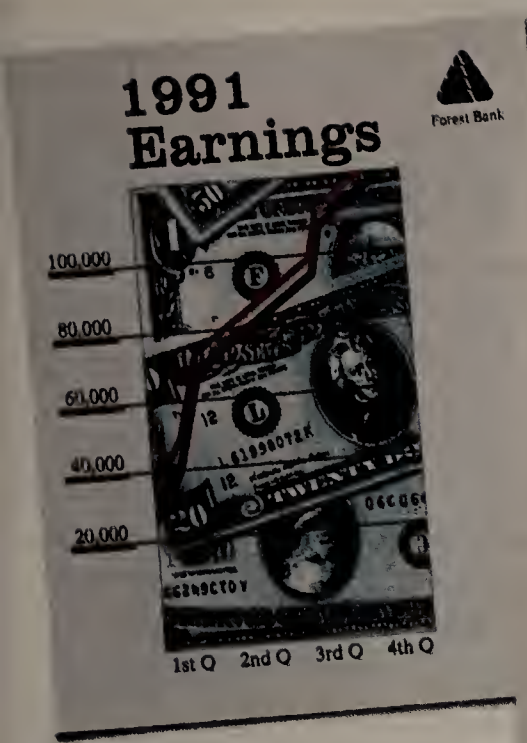

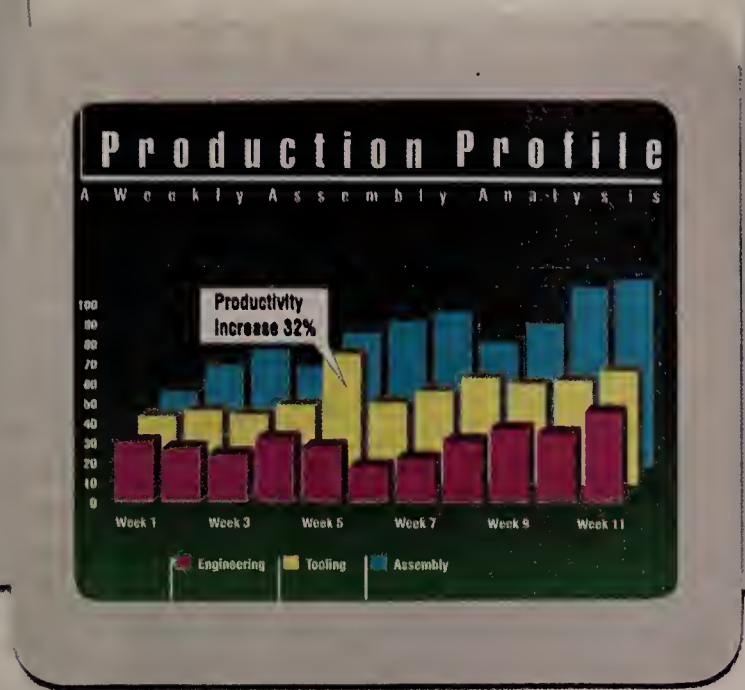

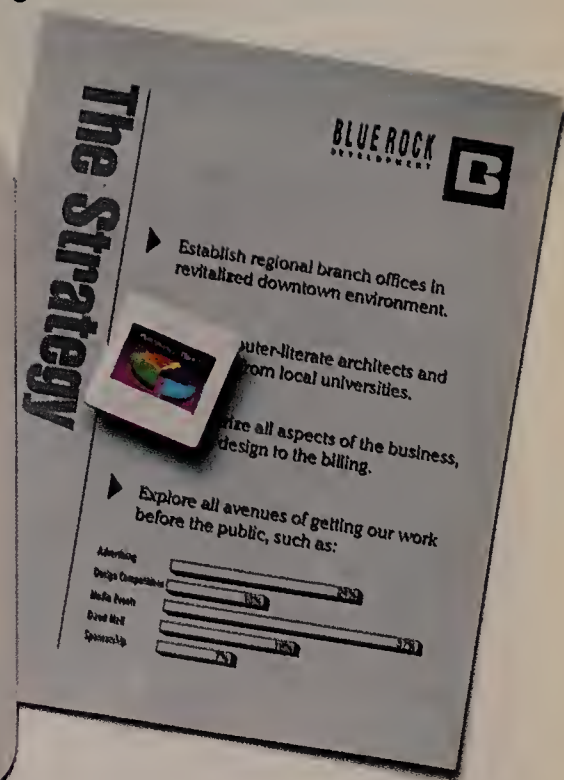

Bravos. Cheers. Hurrahs.

We found APPLAUSE II to be easier to work with than either Harvard Graphics or Freelance Plus, and faster than the Windows-based products.

INFOWORLD
JUNE 11, 1990

APPLAUSE II handles charting, drawing, and on-screen presentations with a fluidity and ease-of-use not found in either Harvard Graphics or Freelance Plus—and it does all this in a mere 512K.

PC MAGAZINE MARCH 13, 1990

PC/COMPUTING APRIL 1, 1990

It's graphical. It's interactive. It makes excellent use of the mouse. Best of all, it abandons the stodgy fill-in-the-form approach to creating charts that is used by Freelance, Harvard and 35mm Express.

The critics are raving about its ease-of-use and intuitive "Windows"-like interface. And how APPLAUSE II™ turns data into 37 different chart types automatically. In black and white or 3.6 million colors. Creating everything from dazzling overheads, slides and on-screen presentations to high-impact hard copy.

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lows you to have the macro dynamically alter dates during playback so that, for example, a macro run on the first of the month can refer to the first day of the *preceding* month.

Both of these programs are TSRs. In the unlikely event that your comm server isn't being used at night, however, you can use a utility called WAIT.COM in a batch file instead—as long as you remember to run it every night before you leave. WAIT causes the batch file to pause until some specified time within the next 24 hours before executing the next batch file command. For example, a batch file with the two commands WAIT 3:15:00 and REBOOT would solve your problem by relinking the comm server at 3:15.

WAIT.COM and rebooting utilities (under names like REBOOT.COM, WARMBOOT.COM, and so on) can be found in several variations on almost every BBS. (On CompuServe, type **go ibmsys**, press <**Enter**> twice, press **3**<**Enter**> for Libraries, **1**<**Enter**> for DOS Utilities, **1**<**Enter**> to Browse, and use **wait** or **boot** for the keyword.) You can also find instructions for creating your own REBOOT.COM at the end of the "PC World Step-By-Step Guide #2" in last month's issue.

(continues)

POWER TIP NO. 133

Choose Your Files in Windows 3.0

It's often useful to select multiple files from a File Manager directory window. For example, you can choose a group of temporary files and then press <**Delete**> to erase them. Or you can click and drag selected files to copy or move them to other directories. When you click the left mouse button to select an individual file, any other selected files are automatically deselected. To select more than one file, you must hold down the <**Ctrl**> key after selecting the first file while you use the mouse to click on the other file names. To select a consecutive subset of file names, select the first name, then hold down the <**Shift**> key and click on the last name. This trick takes practice, but after you get the hang of it, you can select sets of files in a jiffy.

Tom Swan
Contributing Editor

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Circle 11 on reader service card

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Get More Fonts For Less

EMERYVILLE, CA—MicroLogic Software has released Version 2.0 of MoreFonts; its popular font design and generation program. MoreFonts helps you create thousands of typefaces for use with the most popular PC word processing and desktop publishing programs. It includes 17 typefaces with 40 symbol sets containing legal, international, and graphic characters. All font selections can be previewed on screen.

On-The-Fly Scaling

The new release adds "on-the-fly" downloading of fonts directly to your printer when using WordPerfect or Microsoft Word, to save hours of time and megabytes of disk space. "MoreFonts loads requested fonts directly into the LaserJet, thereby avoiding the hassle of selecting and making separate bitmapped fonts in advance," explained Frank Hainze, president of MicroLogic Software. "Just select any size font from within your application, choose the shading or special effect, and then print. MoreFonts provides more scaling capabilities than either a

LaserJet III or a PostScript printer — for all the HP compatible lasers."

Fonts for Windows 3.0

MoreFonts provides quick installation for WordPerfect 5.01/5.1, Microsoft Word 4.0/5.0, MultiMate 4.0, XyWrite III Plus, Xerox Ventura Publisher 1.1/2.0, First Publisher 2.0/2.1, and all applications under Windows 2.0/2.1/3.0 including PageMaker, Excel, Ami, etc. For Windows applications, Word Perfect and Microsoft Word, MoreFonts supports bitmap as well as scalable printer fonts, with matching screen fonts.

LaserJetIII Support

MoreFonts generates the largest fonts your printer can print (from 2 to 999 point) in the highest resolution possible (300 dpi) on the popular Hewlett-Packard LaserJet III, IIP and IID printers. It also supports the LaserJet Series II, 2000, Plus, 500 Plus, DeskJet, DeskJet Plus, and Dot-Matrix printers (for First Publisher). MoreFonts runs on any IBM PC, XT, AT, PS/2 or compatible with at least 384K bytes of memory, DOS 2.0 or later, and a hard disk.

Thousands of Special Effects On Exhibit

LOS GATOS, CA—Thousands of special effect fonts, created with MicroLogic Software's MoreFonts font generator, went on exhibit today.

"Once you've selected a typeface, you can specify over 50,000 combinations of point size, pattern, outline, shadow, orientation and symbol set," said Dick Brown, president of Brown-Wagh. "So when black type isn't enough, you can combine your choice of 6 outlines, 8 shadows, 27 fill patterns, and 28 background effects for eye-catching variety. You can use a touch of conservative gray or a splash of something really wild."

Type Contour White Shadows Type Wood Grain Radial Sunrise Sunset

Critics Say "Thumbs Up" to MoreFonts

Dale Lewallen, PC Week
"MoreFonts could be a one-stop shop for most users. By providing automatic font installation for several different applications, a surfeit of special effects, 40 symbol sets and a good selection of typefaces, the package earns a high rating for value."

David Dean, PC Publishing
"MoreFonts wins on speed hands down. The typefaces included are comparable with typefaces costing more than eight times as much."

Mark Brownstein, InfoWorld
"Even if the fonts weren't so good, MoreFonts would be a great way to experiment with fonts. With the outstanding quality, it's an even better deal."

David Dean, PC Publishing
"Finally the ease of use of MoreFonts should make this a good choice for those just learning about their LaserJet or compatible printer; advanced users will find this package suits all of their font needs."

Benchmarks, LaserJet Journal
"MoreFonts is the overall winner of the seven font generators we tested . . ."

BENCHMARK TEST RESULTS

Rank	Product	Speed	Font Qlty.	Features	Total
1	MoreFonts	7	5	6	18
2	Font Solution Pack	2	6	7	15
3	Type Director	6	4	4	14
4	Glyphix	3	7	3	13
5	Fontware	5	3	2	10
6	Digi-Quilt	1	1	5	7
6	FontMaker	4	2	1	7

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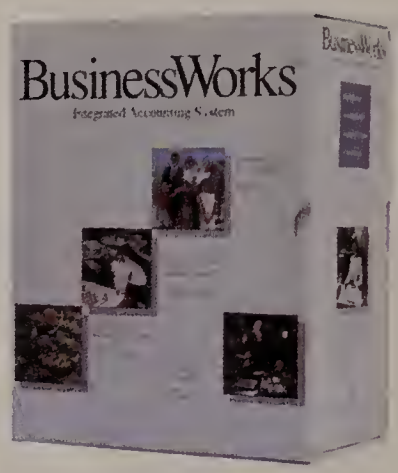

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Complementory Solutions
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404/454-8033, 404/452-8862 (fox)
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Reader service no. 601

Auto-Might
The Pendulum Group
333 W. Hompden Ave. #1015
Englewood, CO 80110
303/781-0575, 303/761-2440 (fox)
LIST PRICE: $99
Reader service no. 602

Swapping Printer Ports

Q. *I have two printers connected to parallel ports LPT1 and LPT2, respectively. Some of my applications let me choose either a "parallel" or "serial" printer, but the parallel option selects only LPT1. At times, I'd like to print from these programs to my laser printer on LPT2. DOS's MODE command can redirect parallel port output to a serial port but can't redirect it to a different parallel port. Any suggestions on how I can get these programs to print to the laser printer on LPT2?*

Janet A. Carra
Soldotna, Alaska

A. Instead of teaching your LPT1-only applications to recognize LPT2 (no easy task), you can have a simple DOS program swap the port assignments: Your laser printer's port will be LPT1, and the other printer will be connected to LPT2. Running the program a second time resets the port assignments.

All the program has to do is swap the values in one pair of bytes for those in another pair. Check out this month's "PC World Step-By-Step Guide" to learn how to create the port-swapping program, SWAPLPTS.COM.

How does...? What can...? Should I...? Send your PC questions to The Help Screen; *for details see How to Contact PC World, page 4.*

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Fax #: (_____) _____

1. Which products are you most interested in?
☐ 286-based systems ☐ UNIX®-based systems
☐ 386-based systems ☐ Laptops
☐ 386SX-based systems ☐ Other: _____
☐ 486-based systems

2. Are you interested in computer products for:
☐ Home ☐ Business ☐ Resale

3. How many PCs does your company plan to purchase in the next twelve months?

Quantity	Timeframe	Quantity	Timeframe
_____	Less than 1 month	_____	6-12 months
_____	1-3 months	_____	More than 12 months
_____	3-6 months		

4. What do you plan to use computer products for?
_____
_____
_____

5. How many PCs do you have installed now at your company?
_____

6. Are you interested in leasing? ☐ Yes ☐ No

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☐ 386-based systems ☐ Laptops
☐ 386SX-based systems ☐ Other: _____
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_____
_____
_____

5. How many PCs do you have installed now at your company?
_____

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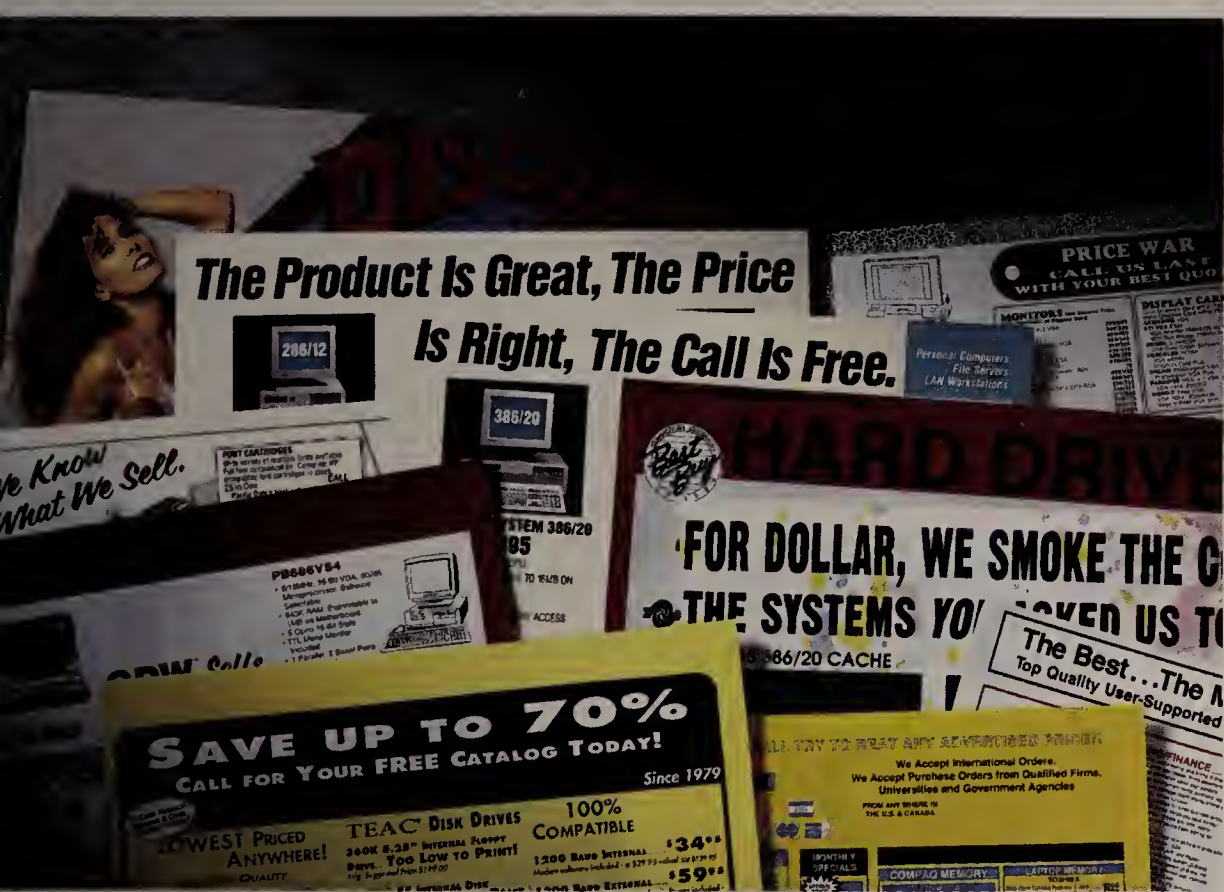

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Compaq SystemPro 486/33

■ ***From this foundation, create a powerful PC network or UNIX workgroup.*** Dell's new systems have more than enough performance to function as a LAN Server and WAN or internetworking gateway. So they're capable of supporting the most demanding server use—a multi-function network. Of course, they're completely compatible with all major network operating systems, including Novell, 3COM and Banyan.

In a UNIX environment, the 425TE and 433TE are perfect for workgroups supporting either traditional multiuser or high-speed client/server environments. You can buy Dell servers preloaded with UNIX System V, making them literally plug and play. Even more impressive is the fact that UNIX system administration can be done by Dell, remotely.

Servicing servers is beyond most Compaq dealers. If a server happens to go down, your whole company can go down with it.

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We wouldn't.

That's why we have a special advanced systems hotline for you to call. It's manned by specialists with the UNIX source code licensed from AT&T.

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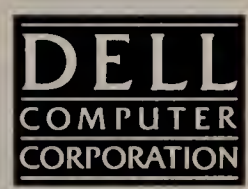
There's a lot more to know before you buy a server. When you call Dell, our experts will give you the help you need to buy a server.

Then we'll send it off with a 30-day no questions asked money back guarantee, and a one year limited warranty.

Call us.

We'd like to make believers out of you.

Above and beyond the call.



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Talk about good things falling into your lap.

Dell's first laptop—the 16 MHz 386™SX—was *PC Magazine's* Editor's Choice, and won *PC Week's* Corporate Satisfaction Poll for 386SX laptop computers.

Now we've made a faster 20 MHz model, with a new higher contrast display.

And it's only $3,899.

Which is a hefty $2,900 less than Compaq's SLT 386s/20.†

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In fact, it even costs less than most slower 16 MHz laptops.

How those other guys can charge so much is insane.

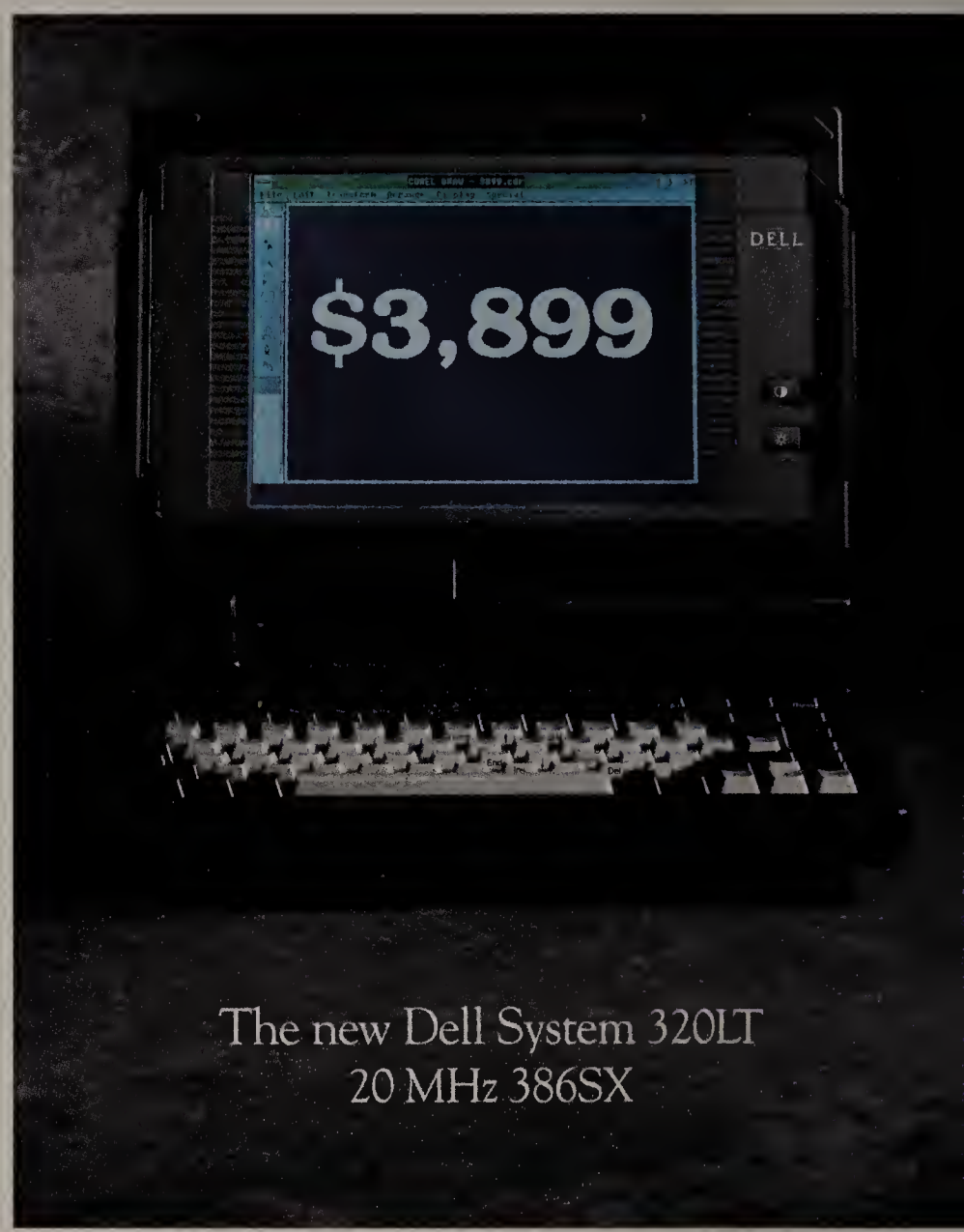
(Here's another good one: We're also cutting the price of our original 16 MHz laptop to $2,999. That should drive our competitors up the padded wall.)

It's a desktop PC trapped in the body of a laptop.

This lightweight laptop acts suspiciously like a desktop system.

With the Intel® 20 MHz 386SX microprocessor, it's as powerful as most desktops.

It's nearly as expandable, too. You get up to 8 MB



THE NEW DELL SYSTEM® 320LT 20 MHz 386SX AND THE DELL SYSTEM 316LT 16 MHz 386SX

- Intel 80386SX microprocessor running at 20 MHz (320LT) or 16 MHz (316LT).
- Standard 1 MB of RAM;* optional 2 MB of RAM expandable to 8 MB (on the system board using 1 MB SIMMS).
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- 83-keyboard with embedded numeric keypad
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- Connector for 101-key keyboard or numeric keypad.
- Connector for external 5.25" 1.2 MB diskette drive.
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△Xerox Extended Service Plan pricing starts at $390 (320LT) or $300 (316LT).

*****Commercial Lease Plan. Lease for as low as $141/month (320LT) or $112/month (316LT).***

316LT: 20 MB, 1 MB RAM $2,999
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Our service goes where you go. If you have a question, our toll-free technical hotline solves 90% of all problems over the phone. If we can't solve it over the phone, we'll send a Dell trained technician from Xerox to your lapside the next business day—nearly anywhere in the contiguous U.S.△

For sale, for lease, for less. When you call us, you talk with a computer expert whose sole mission is to give you exactly what you want. At a great price. We'll custom configure your laptop, give you a 30-day no questions asked money back guarantee, and a choice of leasing plans.◇

Then we'll do a configured system test, and ship it wherever you want.

Call now for either our 16 MHz or new 20 MHz 386SX laptops.

It'd be lunacy not to.

Above and beyond the call.

DELL
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of RAM, a 3.5" 1.44 MB diskette drive and a 20 or 40 MB hard drive. It also has a dedicated slot for a Dell™ Data/Fax modem, and a separate slot for a standard half-length expansion card. (On a Compaq, that expansion slot would cost you an extra $1,000).

When it's time to stay put, you can connect our laptop to an external VGA monitor and keyboard, a 5.25" external floppy disk drive, and even to your network or mainframe.

"Overkill."

That's the kind word *PC Week* used to describe our service.

It came up when Dell™ computers won their first *PC Week* Corporate Satisfaction Poll for PCs, and our service beat the daylights out of everybody else's.

Now that we've won eight out of eight *PC Week* polls, it's even more appropriate. Because each time, our service is called vastly superior. While the service provided by

WHAT SERVICE!

most of our competition is often called "non-existent."

Actually, one of the nice things about our service is that you'll rarely need it. Another poll category we dominate is the one called "reliability"—due in no small measure to our testing on each machine as it goes out the door.

You shouldn't have to go through some Compaq dealer. It's better for you to talk directly to the manufacturer. So we've made it easy to call us direct. We have a staff of technical people trained at Dell who solve over 90% of the problems over the phone, generally in under 5 minutes.

And we're open when you're open. Our normal hotline hours are from 7am to 7pm Central Time, Monday through Friday. On Saturdays, from 9am to 4pm Central Time.

PC WEEK POLL OF CORPORATE SATISFACTION JULY 30, 1990

20MHz 386-BASED LAN SERVERS	OVERALL WEIGHTED SCORE
Dell	1
AST	2
IBM	3
3Com	4

PC WEEK POLL OF CORPORATE SATISFACTION FEBRUARY 5, 1990

25MHz 386-BASED PC's	OVERALL WEIGHTED SCORE
Dell	1
HP	2
AST	

PC WEEK POLL OF CORPORATE SATISFACTION APRIL 10, 1989

20MHz 80386-BASED PC's	OVERALL WEIGHTED SCORE
Dell	1
AST	2
Compaq	2
HP	4
	5

PC WEEK POLL OF CORPORATE SATISFACTION JULY 16, 1990

16MHz 386SX Laptop	OVERALL WEIGHTED SCORE
Dell	1
Toshiba	2
Zenith	

PC WEEK POLL OF CORPORATE SATISFACTION APRIL 17, 1989

80286-BASED PC's	OVERALL WEIGHTED SCORE
Dell	1
CompuAdd	2
Acer	3
Compaq	4
HP	4

PC WEEK POLL OF CORPORATE SATISFACTION FEBRUARY 12, 1990

16MHz 386SX-BASED PC's	OVERALL WEIGHTED SCORE
Dell	1
Compaq	2
Everex	2
IBM	4

286-BASED PC's: Dell, AST, Compaq, Zenith, IBM

Here's Why Our Service Is Rated The Best In The Industry

All service is included in the price of the computer.
Self-diagnostic software.
Toll-free technical support hotline.
Next business day deskside service.

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But let's say your normal hours are ridiculously abnormal.

Even if you're pulling an all-nighter, you can still call the Dell technical library on our new twenty-four hour automated TechFax line. Detailed information will be faxed

WHAT SERVICE?

back to you automatically.

But our help doesn't end there.

We've introduced a Dell Bulletin Board. When you tap into it with a modem, you'll see other questions about Dell computers. Better yet, you'll see Dell's answers, which could help you learn more about your own Dell system.

One more word about your calls:

We log every call you make to us into a database. Over the course of years, we end up knowing your computer better than you do. This familiarity with your computer means better help quicker.

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FOR NETWORKING/UNIX® INFO
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We're actually there when you need us the most. It doesn't happen often, but sometimes even our experts can't solve your problem over the phone. Then we call Dell trained technicians at Xerox and tell them what's going on with your system. They'll come to your desk the next business day, with the solution or part in hand.△

You can test our service right now. We figure the best way to sell you on our service is to show it in action. Call and talk to our technicians. If you don't have a problem, make one up. Or just chat. Get a feel about what we know, and how we handle questions, and what we can do for you.

Okay, we're going to repeat this one more time:

For PC service that's been voted the best in the business eight times, call 800-624-9896.

It'll give you a taste of what you've been missing.

Above and beyond the call.

DELL COMPUTER CORPORATION

HERE'S OUR NEW STORE, SO YOU'LL NEVER HAVE TO GO TO THEIR STORE AGAIN.

When you go out to buy computers, here's what you usually get:

A beefy mark-up.

Pressure to buy something you don't want.

That crummy feeling of not knowing what you're getting, because the salesman isn't sure what he's selling.

And, when there are problems, some stranger with a screwdriver taking your computer apart.

When you call Dell, on the other hand, here's what you get:

A frank talk with computer experts about what you need, and a recommendation about the best overall package for you.

THE DELL SYSTEM 316SX 16 MHz 386™SX.
The perfect low profile mainstream computer.

• Intel 80386SX microprocessor running at 16 MHz. • Standard 1 MB of RAM, optional 512 KB, 640 KB or 2 MB of RAM* expandable to 16 MB (8 MB on system board). • Page mode interleaved memory architecture. • LIM 4.0 support for memory over 640 KB. • Socket for Intel 80387™SX math coprocessor. • 5.25" 1.2 MB or 3.5" 1.44 MB diskette drive. • Enhanced 101-key keyboard. • 1 parallel and 2 serial ports. • 3 full-sized 16-bit slots. • 12-month On-Site Service Contract provided by Xerox.△
Commercial Lease Plan. Lease for as low as $82/month. △Xerox Extended Service Plan pricing starts at $220.
40MB VGA Color Plus System $2,199
Price listed includes 1 MB of RAM. 20, 40, 80, 100 and 190 MB hard drive configurations available.

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A one-year limited warranty.

And a great price, with no mark-up.

Call us now. Why waste a trip when everything you need is right in front of you?

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THE NEW DELL SYSTEM® 433TE
33 MHz EISA i486.™

- Intel® 80486 microprocessor running at 33MHz.

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△Xerox Extended Service Plan pricing starts at $1,040.

330 MB Super VGA Color System
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Price listed includes 4 MB of RAM.
80, 100, 190, 330 and 650 MB hard drive configurations available.

THE NEW DELL SYSTEM 425TE
25 MHz EISA i486.

- Intel 80486 microprocessor running at 25 MHz.

Commercial Lease Plan. Lease for as low as $278/month.
Xerox Extended Service Plan pricing starts at $770.

190 MB Super VGA Color System
(800 x 600) $7,699

Price listed includes 4 MB of RAM.
80, 100, 190, 330 and 650 MB hard drive configurations available.

THE DELL SYSTEM 433E
33 MHz EISA i486.

- i486 microprocessor running at 33 MHz.

Commercial Lease Plan. Lease for as low as $307/month.
Xerox Extended Service Plan pricing starts at $850.

100 MB Super VGA Color System
(800 x 600) $8,499

Price listed includes 4 MB of RAM.
80, 100, 190, 330 and 650 MB hard drive configurations available.

THE DELL SYSTEM 425E
25 MHz EISA i486.

- i486 microprocessor running at 25 MHz.

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Xerox Extended Service Plan pricing starts at $650.

100 MB Super VGA Color System
(800 x 600) $6,499

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80, 100, 190, 330 and 650 MB hard drive configurations available.

THE NEW DELL SYSTEM 333D
33 MHz 386.

- Intel 80386 microprocessor running at 33 MHz.

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Xerox Extended Service Plan pricing starts at $400.

80 MB Super VGA Color System
(800 x 600) $3,999

Price listed includes 1 MB of RAM.
40, 80, 100, 190, 330 and 650 MB hard drive configurations available.

THE NEW DELL SYSTEM 325D
25 MHz 386.

- Intel 80386 microprocessor running at 25 MHz.

Commercial Lease Plan. Lease for as low as $112/month.
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40 MB VGA Color Plus System
$2,999

Price listed includes 1 MB of RAM.
40, 80, 100, 190, 330 and 650 MB hard drive configurations available.

THE DELL SYSTEM 320LX
20 MHz 386SX.

- Intel 80386SX microprocessor running at 20 MHz.

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40 MB VGA Color Plus System
$2,799

Price listed includes 1 MB of RAM.
40, 80, 100, 190, 330 and 650 MB hard drive configurations available.

THE DELL SYSTEM 210
12.5 MHz 286.

- 80286 microprocessor running at 12.5 MHz.

Commercial Lease Plan. Lease for as low as $59/month.
Xerox Extended Service Plan pricing starts at $155.

20 MB VGA Monochrome System
$1,549

Price listed includes 1 MB of RAM.
20, 40, 80 and 100 MB hard drive configurations available.

THE NEW DELL SYSTEM 320LT
20 MHz 386SX.

- Intel 80386SX microprocessor running at 20 MHz.

Commercial Lease Plan. Lease for as low as $141/month.
Xerox Extended Service Plan pricing starts at $390.

40 MB, 2 MB RAM $3,899

Price listed includes 2 MB of RAM.
20 and 40 MB hard drive configurations available.

THE DELL SYSTEM 316LT
16 MHz 386SX.

- Intel 80386SX microprocessor running at 16 MHz.

Commercial Lease Plan. Lease for as low as $112/month.
Xerox Extended Service Plan pricing starts at $300.

20 MB, 1 MB RAM $2,999

Price listed includes 1 MB of RAM.
20 and 40 MB hard drive configurations available.

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Get the credit you deserve.

These are the most comprehensive credit and leasing plans in the industry. For information, call 800-688-3355.

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And if there's any other way we can help out, let us know. We'll do anything to make buying a Dell computer easier.

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Fill out the application for the Dell Direct Advantage MasterCard and return this postage-free card. As soon as you qualify you will receive your card, so you can start earning credits towards new Dell computers.

BTZF 15-027 38-028

YES! I WOULD LIKE TO APPLY FOR A GOLD MASTERCARD® ☐ OR A SILVER MASTERCARD® ☐

Should my application for a Gold MasterCard® not be approved, this request constitutes my application for a Silver MasterCard® and I accept that on a periodic basis I may be considered for an automatic upgrade to the Gold MasterCard® at MBNA America's discretion. The information I provide will also be used to set up my Direct Advantage buyer account.

APPLICATION INFORMATION (Please print clearly)

NAME (first, middle, last)			DATE OF BIRTH	SOCIAL SECURITY NUMBER	
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☐ RENTING ☐ OWN ☐ BUYING	MONTHLY PAYMENT $	HOME PHONE ( )	MOTHER'S MAIDEN NAME (For use when you request special action taken on your account)		
PREVIOUS ADDRESS (If less than 3 years at current address)			CITY & STATE	ZIP CODE	YEARS THERE
NATURE OF BUSINESS			BUSINESS PHONE ( )	ANNUAL INCOME $	OTHER INCOME Which you rely on as basis of repayment $
EMPLOYER	POSITION	YEARS THERE	SOURCE OF OTHER INCOME (Alimony, child support, spousal income, or separate maintenance income need not be revealed if you do not wish it considered as a basis of repayment.)		

CO-APPLICANT INFORMATION (If you wish an additional card issued to a co-applicant over 18 years of age complete the information below.)

NAME (first, middle, last)			RELATIONSHIP	SOCIAL SECURITY NUMBER
EMPLOYER	POSITION	YEARS THERE	BUSINESS PHONE ( )	ANNUAL SALARY $

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MY MASTERCARD®/VISA® ACCOUNT # IS:	MY AMERICAN EXPRESS® ACCOUNT # IS:

PLEASE SIGN AUTHORIZATION

I (we) authorize MBNA America℠ to investigate any facts, and obtain any reports regarding this application and/or resulting account with credit reporting agencies and others. Upon request, I (we) will be informed of each agency's name and address.

I have read this entire application, agree to its terms, and certify that the information is correct.

X_____ (Seal)
APPLICANT SIGNATURE DATE

I have read this entire application, agree to its terms, and understand that I will be jointly and severally liable for all charges on the account.

X_____ (Seal)
CO-APPLICANT SIGNATURE DATE

Annual Fee	$40 Gold MasterCard® $25 Silver MasterCard® (fee for all cards waived first year)
Annual Percentage Rate	19.8%
Grace Period for Repayment of Balances for Purchases	At least 25 days from statement closing date
Method of Computing the Balance for Purchases	Average Daily Balance (including new purchases)
Transaction Fee for Cash Advances and Fee for Paying Late or Exceeding the Credit Limit	Transaction fee for bank and ATM cash advances: 2% of each cash advance, $2 minimum, $25 maximum Transaction fee for Access Check cash advances: 1% of each cash advance, $2 minimum, $10 maximum Late Payment Fee: $15 Over the Credit Limit Fee: $15

The information about the cost of the card(s) described in this application is accurate as of 8/90. This information may have changed after that date.
To find out what may have changed, call us at 1-800-847-7378.
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CONSUMER WATCH

Advice and information for the computer consumer

Got a technical question that needs answering in a hurry? Vendor phone lines aren't your only source of information.

Roberta Furger

Where Can You Turn When Tech Support Fails?

Let's face it. Vendor phone support doesn't always do the job. Busy signals, long periods on hold, and incomplete or incorrect answers can all prevent a quick resolution of your problem.

But striking out with traditional technical support doesn't have to mean hours or days wasted as you desperately try to find someone who can answer your questions. Third-party help is close at hand.

Dial-Up Service

If you're like many PC users, your first inclination when confronted with a technical problem is to pick up the phone and dial the vendor's tech support line. But this time-honored method may not be the best way—or the most efficient—to get your questions answered.

As discussed in this month's feature "Who Pays for Tech Support?," on-line services are being touted by users and vendors alike as a cheaper, more versatile alternative to telephone support. Most major hardware and software companies offer some type of bulletin board service (BBS) where users can post questions, get the latest product news, and download drivers and fixes. All you need is a modem and communications software, and technical assistance is yours 24 hours a day, seven days a week. You aren't limited to the on-line services supported and maintained by vendors, however. CompuServe offers more than 100 forums for PC hardware and software products, many of which were started and continue to be supported by enthusiastic users rather than the product manufacturer.

Both independent and vendor-sponsored forums include three basic components: message services; library areas for downloading bug fixes, updates, and drivers; and live conference areas. Most forums are free to CompuServe subscribers (the annual fee is $39.95), but you may find that some vendor-sponsored forums are available only to registered users of a product.

Vendor-sponsored forums are monitored by a company representative, and a response is usually guaranteed within 24 hours. But independent forums are often just as helpful and as quick to respond, since fellow users don't hesitate to jump in with their own tried-and-true remedies to problems posted on the BBS.

Although the process of posting a message is relatively straightforward, many PC novices may be leery of going this route; there's something comforting about being able to talk to another human being, particularly if you're not on solid technical ground to start with. But when you're feeling adventurous and aren't in an emergency situation, dial up one of the services. You may be surprised at the results.

Users Helping Users

What makes on-line services worthwhile is the broad spectrum of users who are willing to share their experiences. The same dynamic makes user groups an ideal source of technical assistance.

On-line services represent a cheap, versatile support alternative.

Virtually every user group includes a question-and-answer session during its monthly meetings so users can get advice and information from fellow members. Most user group newsletters also feature a Q. and A. section where knowledgeable members will answer questions on a variety of topics.

But what if you can't wait until the next meeting or the next newsletter to get your problem resolved? That's where two other services—user group–sponsored bulletin boards and help lines—play a key role.

"Virtually every user group out there with 100 or more members has a BBS," says Jerry Schneider, a member of the Capital PC User Group and founder of the Association of PC User Groups. "By its very nature a BBS means an ex-

(continues)

ANTHONY RUSSO

change of information on products and services. It's very common for a user to describe a problem and have several members answer."

Although their user base isn't as large or as targeted as a CompuServe forum, user group bulletin boards can be invaluable when it comes to getting problems solved—especially if you're using an obscure product that isn't supported elsewhere.

"Members are never at a loss for words," says Carol Diamond, staff administrator for the Chicago Computer Society, which runs a BBS for its members. "You always get an answer—and more."

Moreover, many user groups don't stop with on-line support. Several of the larger groups—from the Sacramento IBM PC Users Group to the Boston Computer Society—organize telephone support, where members knowledgeable about particular products share

(continues)

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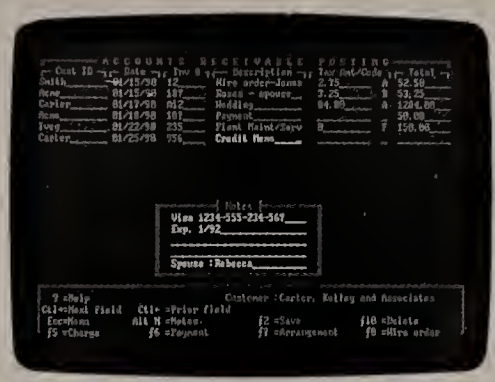

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(go to top of next column)

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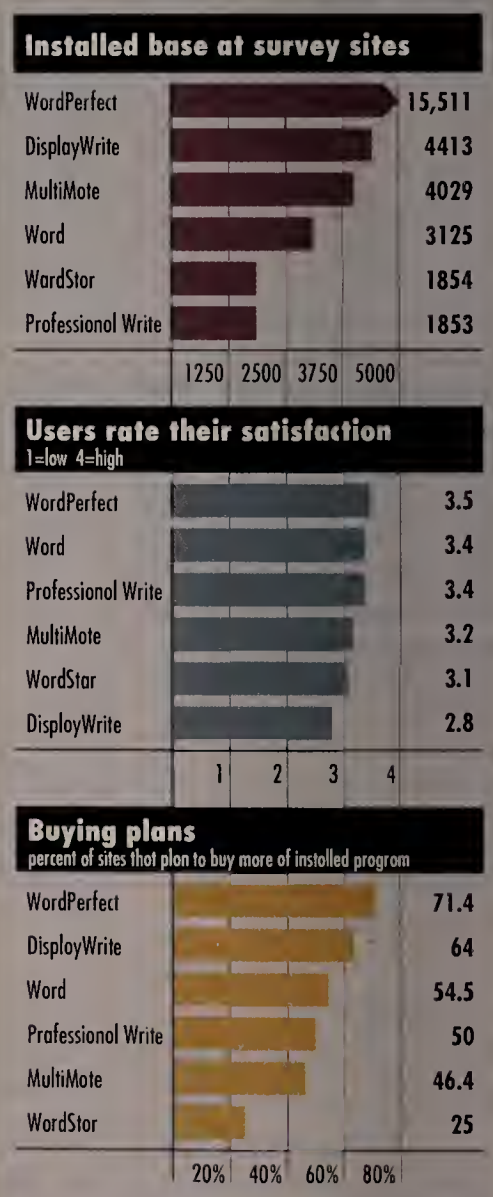
Circle 166 on reader service card

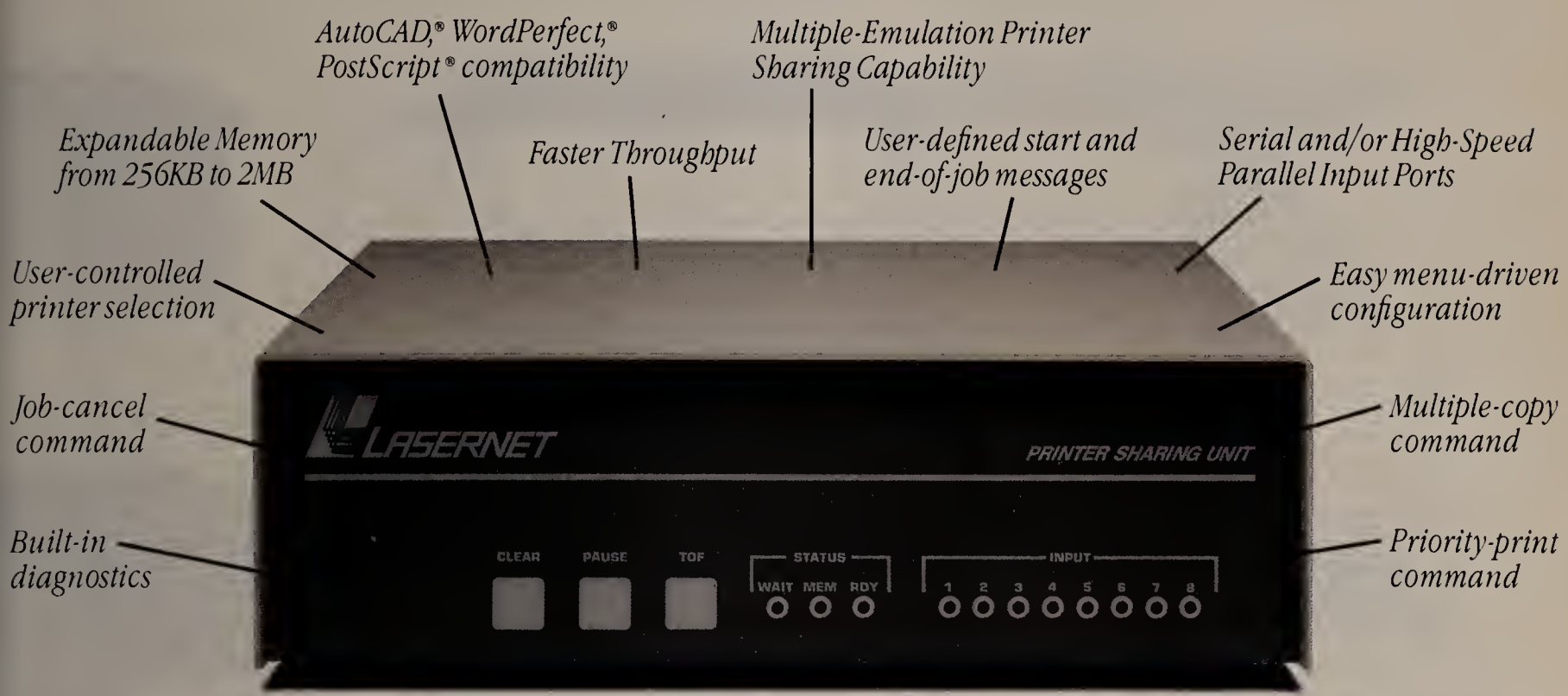
RATE YOUR SATISFACTION: MS-DOS Word Processing Software

WordPerfect continues to hold the number one spot in the word processing category, boasting more than 3½ times the installed base of any of its competitors. Unlike many market leaders, it also gets the highest satisfaction rating among users, and ranks at the top of the plan-to-buy statistics. *Microsoft Word* and *Professional Write* score high marks for user satisfaction, coming in just behind *WordPerfect* in this category.



Source: International Data Corporation. From a survey of 200 organizations, each with at least 50 PCs.

Can printer sharing get any better than this?



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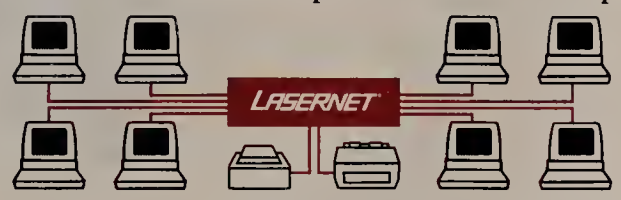

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their expertise. Listings typically are published in the monthly newsletter and include information on the products volunteers are familiar with as well as the days and times they can be reached. The Chicago Computer Society's newsletter, for example, features four pages of names and phone numbers of members who have volunteered to answer questions on everything from obscure shareware products to Lotus's *1-2-3*. And in Houston, 500 members of the HAL PC user group have volunteered their time to answer technical questions.

There's more to user groups, however, than the formal programs they sponsor. Members often go out of their way to assist other users. "When was the last time your dealer made a house call to solve a problem?" asks Schneider. "User group members do that every day."

Formal Alternatives

If you need a more structured way of getting answers to technical questions and vendor-provided support isn't doing the trick, one option is to hire a PC consultant. Organizations are springing up throughout the country that offer fee-based support on a variety of hardware and software products as well as assistance in tying together all the pieces.

One company, Computer Hand Holding of San Francisco, has been in the business of providing third-party technical support since 1983. Although not every company needs a consultant, this option is ideal for firms whose employees aren't sophisticated technically, especially if you "don't want them wasting a lot of time dealing with a vendor's technical support staff," says company founder and president Emil Flock.

Users can pay per call or contract for service.

Even the larger companies that have traditionally offered on-staff help desks are choosing this route as a cost-efficient way of answering technical questions quickly and accurately.

One new firm, the PC Help Line in Marietta, Georgia, offers two types of service. Users can pay on a per-call basis (at $2 per minute), or they can contract for the service based on the number of users supported. The Help Line is open from 9 a.m. to 5 p.m. EST and offers a toll-free number for out-of-state customers.

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(continues)

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PC MAGAZINE EDITORS' CHOICE
March 27, 1990
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"Mace Utilities, Version 1990: Emergency Room Pushes Aside Norton's Disk Doctor"

"...it can get you out of hot water while other programs are vainly attempting to save the day"

- Edward Mendelsohn,
PC MAGAZINE *Associate Editor*

Now that the jury is in, a lot of people who bought Peter Norton's **Norton Utilities Advanced Edition** *wish* they had bought Paul Mace's **Mace Utilities Version 1990** *instead.*

It's easy to understand. In announcing its prestigious Editor's Choice Award, **PC Magazine** noted that **The Mace Utilities Version 1990** *"repairs damage that nothing else has the nerve to even look at."*

Well, here's good news. If you bought Norton Utilities, just *"rob"* the title page from the User Manual, and we'll upgrade you to **Mace Utilities Version 1990** for just $50. That's $100 off the retail price, right now!

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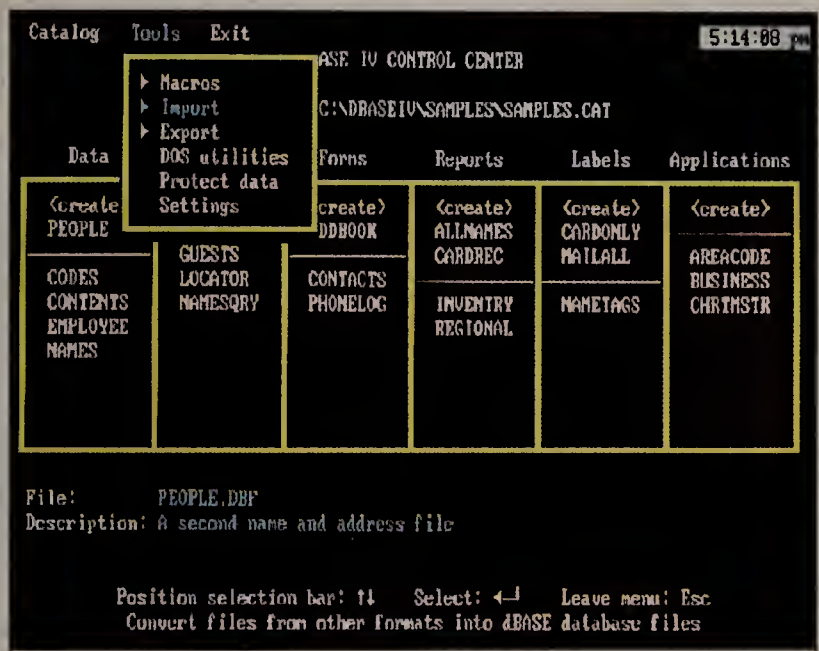

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Schumann, vice president of sales and marketing for the firm.

Mix-and-Match Options

None of these alternatives will completely eliminate the need for vendor support, since there will always be questions that only a product's manufacturer or developer can answer. In its own way, though, each can supplement what's provided by vendors and help ensure that you're not stuck staring at a blank screen, waiting for the phone to ring.

SHOP TALK

Making the Best of a Bad Situation

Recently I received a letter from Hewlett-Packard stating that some early LaserJet IIP's have problems with their power supplies. Mine was one of the affected printers, so I called the toll-free number listed in the letter and was given three repair options by a courteous representative. Here's how HP corrected my problem.

My printer was working perfectly, but HP still scheduled a date to ship me a remanufactured machine. The replacement arrived on the date promised and was indistinguishable from a brand-new machine. After moving my accessories to the new machine, I placed my old machine in the shipping container HP provided, closed it with the tape supplied, and affixed the *prepaid* Federal Express label. I have a new warranty, good for one year from the date of the exchange.

I am now considering buying a new computer. I probably would have overlooked the HP Vectra line, thinking it would be too expensive. Perhaps I will reconsider.

Thomas Schreffler
Newton, Massachusetts

Editor's note: According to an HP representative, some of the early LaserJet IIP printers were shipped out with a faulty power supply that causes premature failure. HP notified users of the potential problem in a mailing to registered owners, as well as in press reports. LaserJet IIP owners who have not been contacted should call 800/233-5153 (in the U.S.) to determine if their unit is affected.

While such defects are unfortunate for all concerned, HP has handled the replacement process with style. Other manufacturers should take note.

Service Worth Writing About

Consumer Watch receives dozens of letters each month from users who are dissatisfied with the service provided by hardware and software companies. It came as a welcome surprise, then, to receive *three* letters commending Plus Development Corporation of Milpitas, California, for its exemplary service and support. In each case, the writer

(continues)

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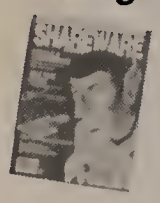
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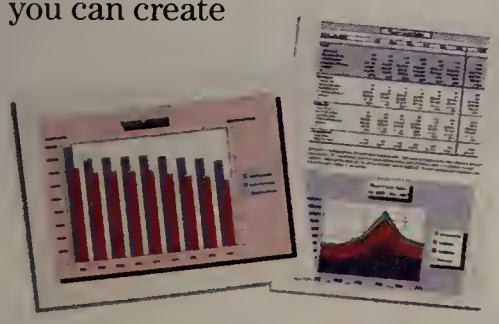

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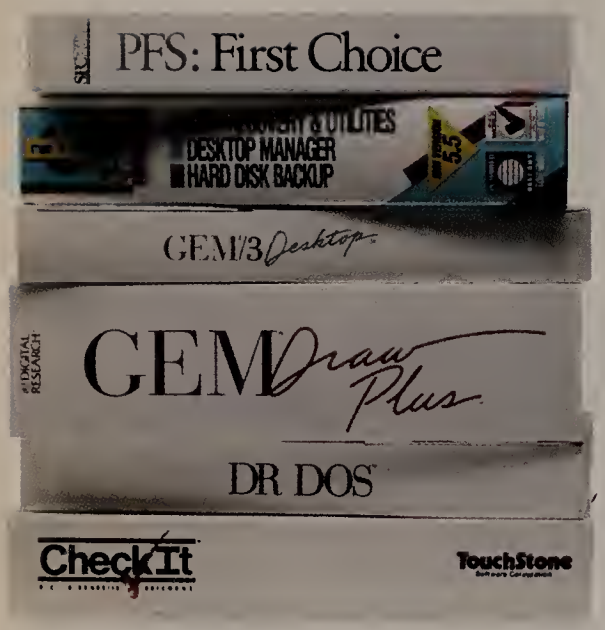

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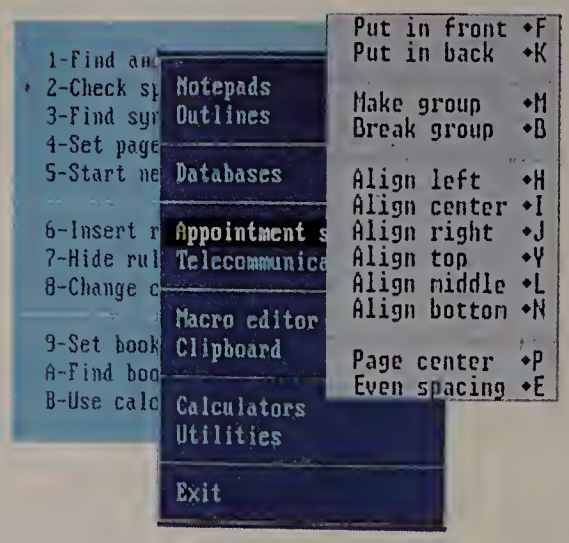

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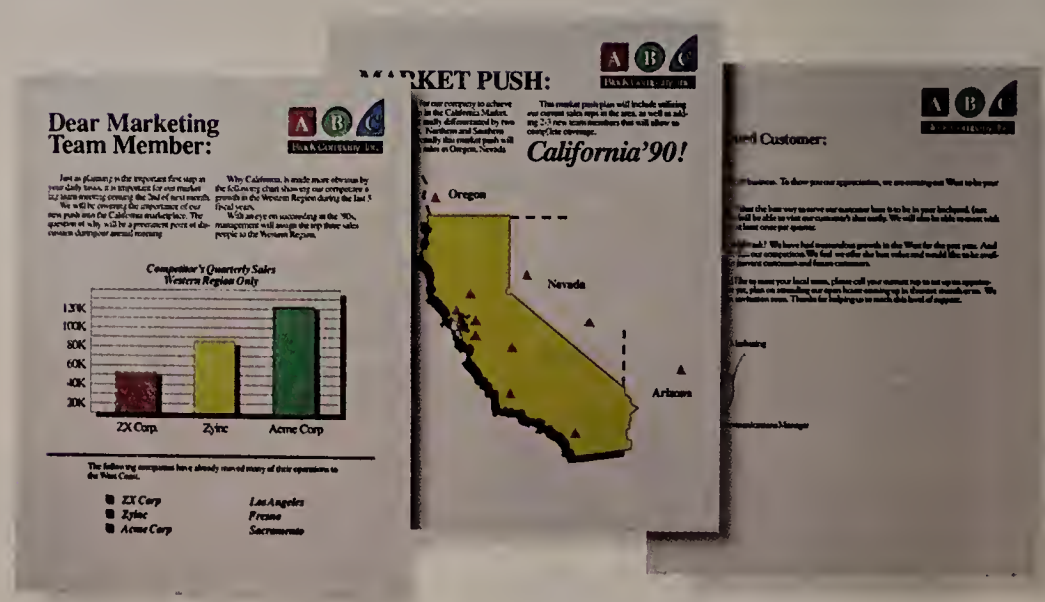

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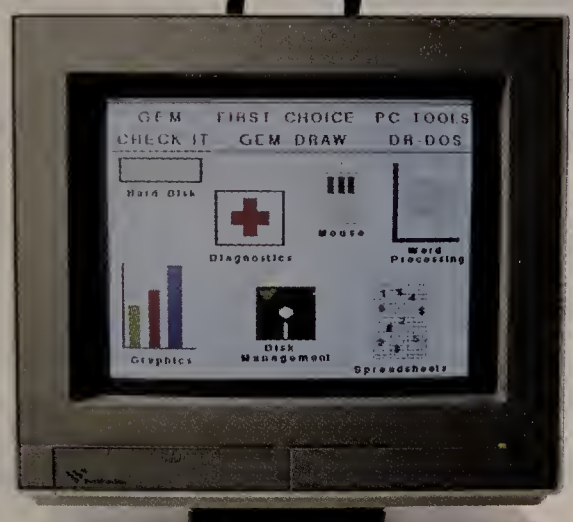

Maybe it's because we make a powerful 386SX™ that's so easy to *use*. Just turn it on, and you're greeted by a friendly, graphical icon-based interface. No DOS to learn! Click the mouse on any application icon (the software is already loaded and ready-to-run) and you're off to the races. The pull-down menus make productivity quick and easy.

Maybe it's because our fully configured system is so easy to *buy*. You get all the hardware you need, right down to the mouse. You get enough software to run a business, already loaded on the spacious 40MB hard-disk. Including word processing, graphics, a database, spreadsheet, and utilities to manage all those files you'll be generating. To show off this easy-to-use software, you get a big, crisp, 14" paper-white monitor. To make it all run fast, you get 1 MByte of RAM, which you can easily expand to 8. The result?

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praised Plus for its friendly and knowledgeable technical staff.

Neil A. Harriman with the University of Wisconsin, Oshkosh, biology department was one who wrote to us about the responsive staff at Plus Development. His problem was diagnosed and corrected quickly and with a minimum of disruption. "Such outstanding customer support and product support should not go unnoticed," writes Mr. Harriman. We agree.

A Dissatisfied Customer

It has been a full month since I returned merchandise to Sefco Computer Products, and I have been unable to get anyone there to see that the refund is processed and a check is mailed to me. In returning the system, I relied on the company's ad, which stated, "If for any reason you're not completely satisfied, return the item for a full refund of the purchase price." I am certainly not satisfied and have called the company to see that a check for a full refund is sent to me without further delay.

W. R. Southern
Southern Temporary Services
Little Rock, Arkansas

Editor's note: Mr. Southern has received a refund from Sefco, minus a 15 percent restocking fee. Although restocking charges are not uncommon in the mail-order business, Sefco's advertisement does not mention such fees on returned merchandise. Given that omission and the money-back guarantee in the ad, Consumer Watch *believes a full refund is in order. In the future, Sefco should either reconsider its policy of charging a restocking fee or state it outright in its ads so customers can make a buying decision based on* all *the relevant information.*

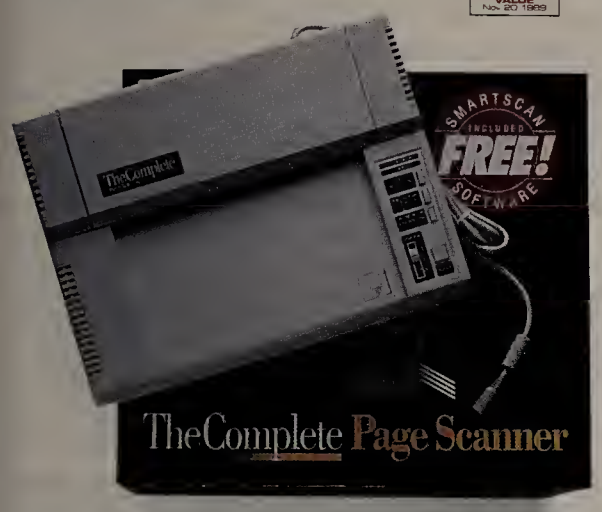
Take action! If you've got a complaint or a compliment, send it to Consumer Watch. *We'll follow up and publish letters with the broadest interest. For more information, see How to Contact PC World, page 4.*

Power Tools for Your PC...

TigerSoftware presents The Complete PC line of professional quality hardware accessories that turns a spare room, a telephone and your computer into a powerful place of business. Add a fax (an indispensable item) to your PC — or your laptop. An internal answering machine can be quickly added to your PC for ultimate convenience and functionality.

Three types of super-sharp scanners (full-page, half-page and hand-held) allow you to easily include graphics and logos into your pages.

The Complete Page Scanner

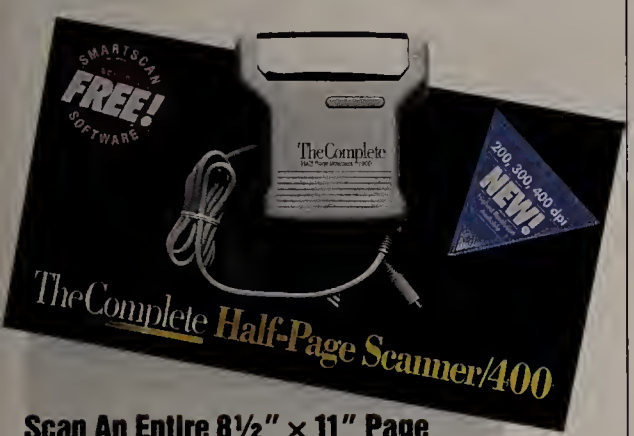


The Complete Page Scanner can scan images up to 8.5″×14″ at 200 or 300 dpi. View images on screen as you scan. Scale images from 10% to 200%; rotate, crop, erase, and pixel edit images. Your choice of three dithering patterns for scanning photographs. Then export images to the most popular word processing, graphics and desktop publishing programs. Save images in Dr. Halo, PC Paintbrush+, TIFF, GEM, MS Windows Paint, and CPC fax formats.

Prints out on laser or dot-matrix printers. Includes scanner, power cord, interface card, SmartScan™ software, user's guide and 90-day warranty. Optional OCR software.

The Complete Half-Page Scanner/400

Scan images up to 4″×14″at 200, 300, or 400 dpi with The Complete Half-Page Scanner/400. View images on-screen as you scan. Scale images from 10% to 200%; rotate, crop, erase, and pixel edit images. Your choice of three dithering patterns for scanning in photographs.



Scan An Entire 8½″ × 11″ Page In Just Two Quick Passes!

Sleek ergonomic design with large viewing window makes it easy to position the scanner accurately on the page. You can export images to the most popular word processing, graphics and desktop publishing programs, or save them in Dr. Halo, PC Paintbrush+, TIFF, GEM, MS Windows Paint, and CPC fax formats. Prints out on laser or dot-matrix printers. Includes scanner, interface card, SmartScan™ software, user's guide and 2-year warranty. Optional OCR software.

The Complete Hand Scanner/400

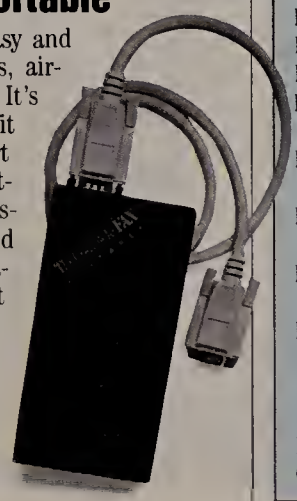
The Complete Hand Scanner/400 is the ideal personal scanner for desktop publishing. Compact, flexible, and easy to use, CHS/400 is perfect for adding photographs, drawings, logos, and signatures to your word processing and desktop-publishing documents. Scan images up to 2½″×14″ at 200, 300, or 400 dots/inch. View the image on screen as you scan. Scale scanned images from 10% to 200% to fit your page. Rotate, crop, and edit your image or merge together multiple images to create a full page. You can export images to the most popular word processing, graphics and desktop publishing programs, or save them in graphics formats.

The Complete FAX/9600

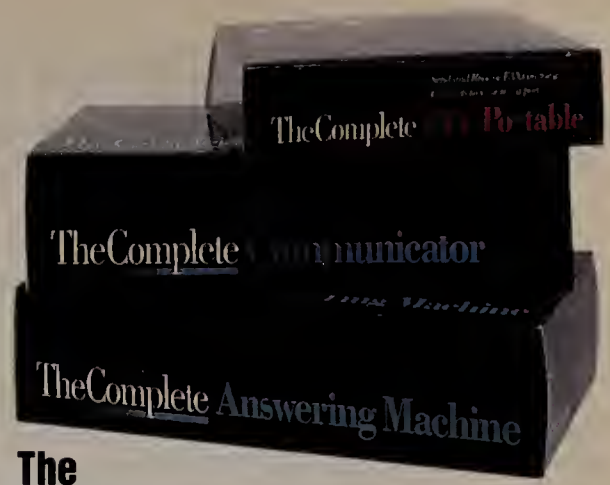
Also Available In 4800 Baud Mode

Send and receive documents to and from any Group III fax machine. Delayed transmission lets you send unattended fax messages when phone rates are lowest. Broadcast feature sends fax messages to multiple locations with a single command. Automatic redial saves time when lines are busy. Operates in background without interrupting the program you're using. Uses just one phone line for both voice and fax transmission. Includes add-in card with 9,600 bps fax with on-board processor, operating software, user's guide, telephone cord, and 2-year warranty.

The Complete FAX/Portable



This external fax makes it easy and less expensive to fax from hotels, airports — anywhere you travel. It's lightweight and small enough to fit in a pocket! Plugs into serial port and runs on AC adaptor or 9V battery. Send and receives fax messages at 9,600 bps. Delayed transmission lets you send unattended fax messages. Broadcast feature sends fax messages to multiple locations with a single command. Includes plug-in fax unit, operating software, AC power adaptor, RS-232 cable, 25-pin adaptor, telephone cord, user's guide, and 2-year warranty.



The Complete Communicator

PC Computing's Most Valuable Product for 1989 delivers 9,600 bps Group III fax capabilities with advanced telephone answering and message management. The 2,400 bps Hayes-compatible modem can send and receive documents to and from any Group III fax machine even while your computer is running other applications. So versatile you can fax directly from your PC, send to multiple destinations at one time, and schedule transmissions to take advantage of lower phone rates.

Automatic redial saves time when lines are busy. Fax forwarding lets you retrieve faxes from another location using any touch-tone phone. Voice messaging records calls even when you're not there, with remote play-back from any touch-tone phone. Deliver your recorded voice messages to multiple locations automatically, any time of day or night. Even includes convenient ports for The Complete PC Scanners.

The Complete Communicator includes add-in card, operating software, BitCom modem software, user's guide, telephone cord, and 2-year warranty.

The Complete Answering Machine

Answers incoming calls even when you're not there. Digitally records incoming and outgoing messages on your hard disk for improved accuracy and quality. Call in from any touch-tone phone to listen to your messages, or to change your greeting or system configuration.

The Complete Answering Machine can automatically call you at any number to deliver messages. Supports up to 999 individual password-protected mailboxes — one for each of your employees, departments or customers. Each mailbox can have its own personal greeting. Automatically calls and delivers your message to a list of people any time of day or night — keeps dialing until all messages are received.

The Complete Answering Machine can share a phone line with The Complete FAX or The Complete FAX/9600. Operates in the background while your computer is running other programs. Includes add-in card, operating software, user's guide, telephone card and template, wallet-sized quick reference card, and 2-year warranty.

TheComplete PC

HW 1715	The Complete Answering Machine	$269.72
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Use dBASE Data or Create Your Own Custom Applications In Minutes!

Consider the database as an amazingly powerful business tool. With Alpha Four you can develop custom applications, manage data entry and verification, easily handle groups of related files from as many as 10 different databases, create professional menus, reports — even paint custom screens — without any programming at all.

No Programming at All? No Way.

You won't type one single line of code. Alpha Four works intuitively to build "smart menus" that can call other menus, execute macros, create temporary variables, and customize data entry and help screens.

And Alpha Four's innovative menus and keyboard shortcuts are faster and more productive than the Assist Mode of dBASE III and the Control Center of dBASE IV. The searching and indexing features extend the power of dBASE and provide sequential searches, index searches, searches by any field, (including memo fields) and multiple searches.

Alpha Four delivers the extensive features of dBASE, along with sophisticated relational capabilities, without the crippling learning curve. Build an index of several databases, then link up to ten files by simply defining a linked set.

"I Need Detailed, Complex Reports..."

Just name it. Quickly define the sections (or bands) of your report, the title, up to nine subgroupings and a summary. Text is handled for you with a host of advanced features. Or, if you're up against a tight deadline, Alpha Four can create reports for you, using its Quick Report option. Of course, Alpha Four imports and exports Lotus 1-2-3, dBASE II, ASCII and other file formats in a flash.

TECHNICAL NOTES: Alpha Four Scores Big!

Tiger has looked at other relational databases and finally found one worth carrying. All others have either been too complicated or not powerful enough. Alpha Four offers the perfect mix. We were able to import a 2MB ASCII file, for example, and quickly post price changes on a monthly basis with about 8 keystrokes!

Database Specifications and Field Types

- 128 fields per record; 4,000 characters per record
- 2 billion records per database
- Databases per disk limited only by disk capacity
- Field types: Character, Numeric, Date, Logical, Memo

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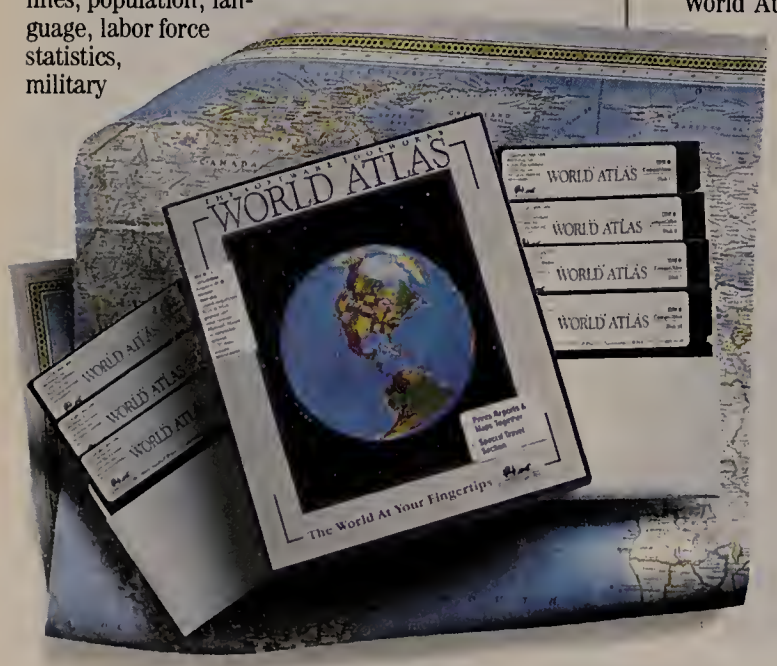

Indispensible Guide and Reference Tool.

World Atlas is an ideal reference tool for travelers, educators, business people, librarians and students. It's an indispensible guide that brings together all types of important information that would take months to research. With just a couple of keystrokes any bit of data is on your screen. And World Atlas includes a special travel section, containing information of particular interest to travelers that includes information on topics such as monetary conversion rates, seasonal facts and language.

World Atlas is very easy to use. You don't need to learn lengthy commands. Just point to a country on any index map, click — the desired map appears instantly. From there, simply select specific information and statistical maps for individual countries from sleek, drop-down menus. You can easily print customized reports mixing maps and text — even export maps to desktop publishing programs for use in your newsletters, reports and other publications.

World Atlas contains three types of maps: thematic, reference and regional relief maps. These maps provide a wealth of knowledge about any area you'd like to explore. There's also volumes of comparative data on every country in the world in five subject areas: geography, people, government, economy, and communications.

And all information contained in World Atlas is obtained from world organizations and U.S. Government sources for up-to-date accuracy.

NOW AVAILABLE! U.S. ATLAS

U.S. Atlas brings the entire North American continent to your computer screen! Simply click on a state, county or even a city to explore such information as: population, average temperatures/precipitation, latitude/longitude, local time, area codes and zip codes. What's more, everything your need to know will be displayed in easy-to-read windows.

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- *It's easier to use, because it has only one command. Your word processor does the rest.*
- *Inserts messages directly into the text to point out problem areas in letters, proposals, reports.*
- *Now runs from within WordPerfect, MultiMate, Microsoft Word, WordStar, Professional Write and Q&A Write.*
- *Indexes measure strength of delivery, readability, use of adverbs, adjectives, jargon.*
- *Uses more then 5,500 rules to make recommendations.*
- *New Menu System allows you to customize RightWriter to meet your particular needs.*

Now Runs From Within Six Major Word Processors.

RightWriter's direct interface works within the six major word processors: WordPerfect, MultiMate, Microsoft Word, WordStar, Professional Write and Q&A Write.

Specific Recommendations *RightWriter flags common writing errors such as passive voice, noun-verb agreement and more.*

Readability And Strength Index *The Readability Index shows the educational level a reader requires to understand your writing.*

Parts of Speech, Sentence Structure *Other indexes measure your adjective and adverb usage, and use of jargon. Recommendations guide you in how to improve your sentence structure.*

Words to Review *The Words In Review list points out problem words that could cause confusion.*

RightWriter vs. The Competition.

Dr. Cynthia L. Selfe, Associate Professor of the Humanities Department at Michigan Technological University independently tested the big three grammar and style checkers. The results? — RightWriter wins hands down!

Researchers at Michigan Technological University tested the three IBM PC-based grammar and style checkers. The following is an excerpt from the letter which accompanied their findings...

"We've finished our independent tests comparing the performance, accuracy and usefulness of RightWriter 3.1, Grammatik and Perfect Grammar on two separate documents: one ("Testbed") that you have sent to us and another ("Ties") that we selected independently.

As you can tell from just a quick glance at the enclosed tables, RightWriter impressed us as far as style-analysis programs go: RightWriter correctly flagged 176 errors (with a total error rate of only 8 percent) in an essay that saw more than twenty major revisions.

RightWriter has such a low error rate that the program rewards users instead of overwhelming them. RightWriter's manual was also both easier to read and more informative than either Grammatik's or Perfect Grammar's. Finally, RightWriter's problem explanations form a good refresher course in grammar and style.

We believe RightWriter would be of value to writers interested in improving the surface structure of their writing. We applaud RightSoft's attempts to test their products thoroughly and in realistic situations; your company has a couple of fans in Houghton, America.

Sincerely, Dr. Cynthia L. Selfe."

Associate Professor, Humanities Department
Michigan Technological University, Houghton, Michigan

Which Grammar Checker Would You Trust?

Results for *Test Document 1*	RightWriter	Grammatik
Total Flags*	**4124**	1290
Correct Flags*	**4065**	1118
Incorrect Flags**	**59**	172
Error Rate	**1%**	13%

Results for *Test Document 2*	RightWriter	Grammatik
Total Flags*	**201**	182
Correct Flags*	**174**	118
Incorrect Flags**	**27**	64
Error Rate	**13%**	35%

**A higher value is better. **A lower value is better.*

TEST NOTES: *Flags were identified as "incorrect" if the program suggested textual changes where none were required or each time a program flagged a compound adjective as possibly mispunctuated when the word was punctuated correctly.*

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PC-Writer®
PeachText®
pfs: Write®
pfs: Prof. Write®
pfs: First Choice®
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Samna®
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WordPerfect®
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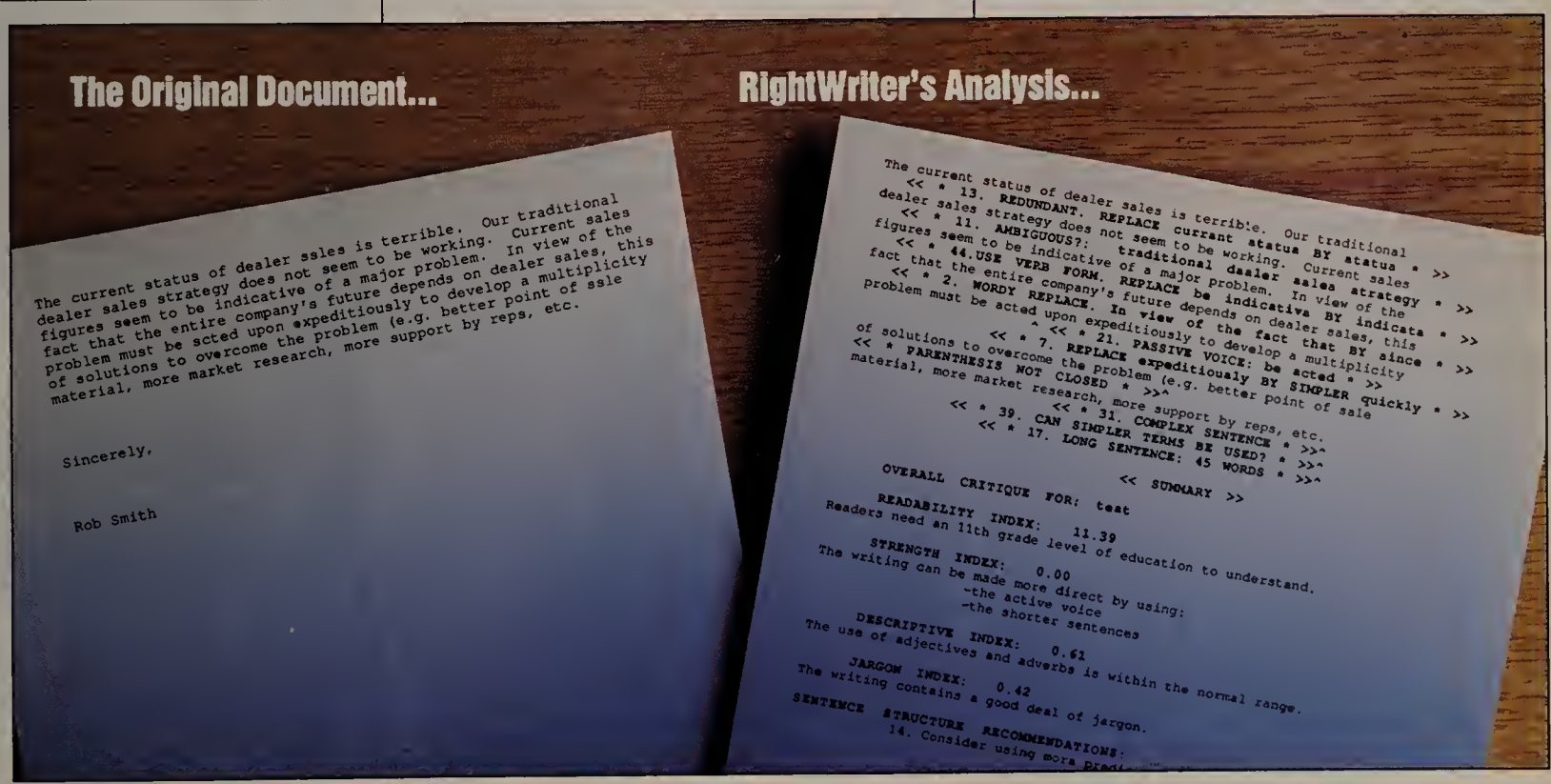
All Standard ASCII Editors



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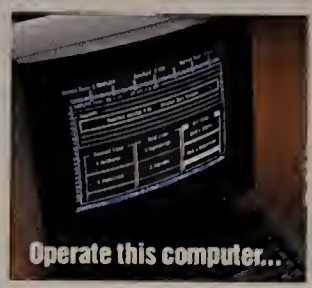
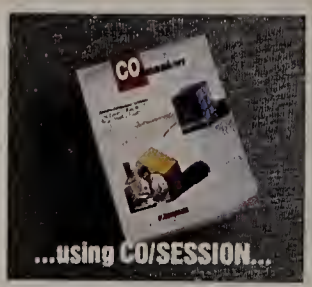
CO/SESSION allows you to quickly connect your computer to a distant PC (on a phone line) and run that remote computer as if you were right there — at the keyboard! From a laptop in a hotel room, you can control your PC back at the office — even if it's more powerful — provide training, or troubleshoot a customer's system from your office.





You can even print documents on either, or both systems simultaneously. And Co/Session 4.0 includes an all new *"windows-like"* interface for speed and convenience, plus error-checking, seven advanced new security features, EGA, VGA and Hercules support (for graphics) and much more.

Easy to Use.

The best package available for *remote computing, remote customer support, background file transfers and remote network access.* Easy to use — just install it — Co/Session sits in the background using only **51K**. Use hot keys to quickly call up Co/Session on either the host or remote PC.

Advanced Security.

Co/Session protects your data with features like: dual-passwords, password-checking and data encryption. You can restrict the ability to send or receive files on the remote PC, blank the other computer's screen — even disable its keyboard to prevent unauthorized access.

Fastest Remote Software Available.

Co/Session transfers files up to 20% faster — updates screens up to 400% faster than competitors! In fact, Co/Session was proclaimed "Fastest Remote Software Package" by *InfoWorld* in March, 1989!

And Co/Session is fully compatible with all leading software like Lotus, WordStar, WordPerfect, dBASE IV, and SideKick.

SYSTEM SLEUTH...

Discover Hidden Configuration Details Inside Your PC!

System Sleuth is an easy-to-use, advanced "passive diagnostic" system that probes deep into the heart of your PC, illuminating secrets (and pitfalls) — without damaging your precious data. Extensive helps screens aid in understanding how your computer works — and why it won't! System Sleuth also gives you the information necessary to make smart configuration decisions when adding new hardware and software — maximizing its performance — and avoiding conflicts.

In addition, System Sleuth helps you avoid needless repair bills and provides details that can be helpful when obtaining technical support from hardware and software manufacturers — your system status is displayed right on the screen.

You'll have instant access to information on processor and card types, BIOS date, DOS version, ports used and memory installed, including a complete rundown of what's contained in each 64-KBtye segment up to 1 MByte. Display TSRs loaded, their functions and memory allocation, interrupt vector tables, device drivers loaded (and attributes) and disk information (including bad tracks).

Also Available, WinSleuth for Windows

An all new version of System Sleuth for Windows 3 protected environment. The familiar reporting features of System Sleuth are available as well as many new analysis tools for Microsoft.

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HW 3830 **Session/XL** 5¼" & 3½" **$95.00**
HW 1060 **System Sleuth** 5¼" & 3½" ... **$99.00**
HW 1065 **WinSleuth** 5¼" & 3½" **$99.00**
IBM PC, XT, AT, PS/2, compatibles with 256K (host PC requires 50K).

Expand Your Power and Control Over Lotus 1-2-3 Macros!

Go Inside and Diagnose Any 1-2-3 Macro Error!

Many PC users all over the world have come to realize the power of Lotus 1-2-3. Not only is it a great spreadsheet program, its macros make it a powerful computing language unto itself. Anyone who knows 1-2-3 quickly realizes you don't know 1-2-3 until you know how to do macros. 1-2-3 macros let you automate a whole range of tasks that save time and energy. They make Lotus 1-2-3 the revolutionary program it is.

But 1-2-3 macros, like any programming language, have their special characteristics that turn little syntax errors into monstrous problems. Everyone who uses 1-2-3 macros undoubtedly knows the frustrating ERROR message that inevitably crops up when you're trying to run a new macro. Even the best 1-2-3 macro developers run into snags when putting together a macro.

The Macro Solution.

Until now, the only answer for those frustrating situations has been invoking the 1-2-3 STEP mode. You start at the beginning and poke along until an error message pops up on the screen. After you've figured out what's wrong, you go back to the beginning and start all over again. To make matters worse, if your macro contains the [WINDOWSOFF] and [PANELOFF] commands, you're sailing in the dark. There's nothing more frustrating than trying to get a job done with a macro you can't get to work and having no help with it. On routine 1-2-3 questions, you can ask whoever is around for help or call technical support. With macros, you either find an expert or you can just give up.

Now, there's a better way — the Personics Macro Editor/Debugger (MED), an enormously powerful, truly interactive, and genuinely easy-to-use tool for developing, debugging, and maintaining 1-2-3 macros. As soon as you find a problem with one of your macros, just pop up the MED debugger window and quickly find out what you need to change. The Personics Macro Editor/Debugger will become your private technical support line, immediately available whenever you need it.

No Need To Be Frustrated Any Longer.

You'll be amazed at how much more productive you'll be with MED in your tool kit. When an error condition is identified in MED's debugger window, you can jump to the editor window, quickly make a change, then resume execution where you left off. And MED's expanded error messages give you the information you need to understand why your macro errors have occurred. Each error message is also described in depth in MED's detailed handbook. From now on, if you have a problem with a macro, you know where to turn.

With the Personics Macro Editor/Debugger, you won't dread attempting long 1-2-3 macros because you're afraid they won't work. You can track down even the most elusive macro problems simply and easily and then know how to fix them. You can start macro execution anywhere and follow along at a choice of speeds or set watchpoints to monitor important variables. With MED, you can set breakpoints to halt execution when a user-defined condition is met. Each of the Personics Macro Editor/Debugger's features are designed to make developing and debugging your macro jobs as easy as possible.

Fast, Effective, and In-Depth.

Sometimes, you have to play doctor with a software package like Lotus 1-2-3 to get the most out of it. Should I have done this in my macro? Or should I have done that? Sometimes, being the best doctor isn't enough to diagnose the problem with a complicated macro. That's when MED comes in.

The Personics Macro Editor/Debugger is receiving wide praise for its effective way to shortcut 1-2-3 macro errors. "No serious macro developer should be without this tool," says noted macro expert Scott Tucker. The Personics Macro Editor/Debugger — your complete diagnostic kit for 1-2-3 macros.

personics

HW 2830 **(MED)** 5¼" & 3½" **$199.95**
IBM PC, XT, AT, PS/2 and compatibles. MED works with 1-2-3 Release 2.0, 2.01 and 2.2 and uses approximately 65K of RAM. If you are using 1-2-3 Release 2.0 or 2.01 and MED is your only add-in, you'll need approximately 20K of RAM for the 1-2-3 Add-In Manager.

FREE FEDERAL EXPRESS SHIPPING **To Order: Call Toll-Free (800) 888-4437** *International Orders: (305) 443-8212*

Circle 259 on reader service card

Don't Make a Quick Decision — Get the Accounting System with Room to Grow...

Money Matters for Small Businesses That Are Quickly Becoming Large Businesses.

Accounting software for home and small businesses must be two things: 1.Easy enough to get started on right away, and 2. flexible enough to ADAPT TO THE USER'S SITUATION, then grow as they become more experienced and demanding. If both these elements aren't present, the accounting system simply won't be useful.

Money Matters is a less complicated approach to financial management for the home and small office. It combines fast, on-screen transaction handling, instant balance updates, simple check writing, invoicing and detailed financial reporting.

The beauty of Money Matters is that it actually adapts its functionality to the way you run your business, instead of cramming some complex accounting concept down your throat. If you're a contractor, for example, you can easily track costs and hours for each phase of a project. If you own a fleet of taxicabs, you can track income and costs by cab. If you run a small retail store or factory, you can track inventory any way you like for complete financial control.

Get Started Right Out of the Box. Set-up Is Done for You.

You don't have to know anything about accounting to become instantly productive with Money Matters. There are no time-consuming set-up procedures or accounting techniques to learn. Choose from 14 pre-defined business categories. When you select one, the account tables are automatically established. Quickly enter starting data into Money Matters' handsome interface and from then on, each function is as easy as writing a check.

The Fastest, Easiest Checkbook Management Concept Ever!

No other software program is as thorough in this area as Money Matters. Payments, deposits and reconciliations can be made automatically, and transactions can be distributed in up to 20 different ways. Money Matters will automatically track and report interest income for you and provide balance sheets, management reports, invoice analysis reports and up-to-the-minute profit and loss statements.

When tax time rolls around Money Matters is there with complete, organized information. And Money Matters automatically monitors credit card and bank account transactions, to help you forecast your cash requirements.

Take Care of Your Customers.

...And your vendors. Money Matters can easily handle up to 4,000 vendor and customer accounts. Track year-to-date figures, print mailing labels, lists, and reports.

Take Care of Your Company.

You'll collect receivables sooner because Money Matters helps you stay better organized so invoices go out on time ... stay on top of late payments ... even automatically add finance charges if you want to. You'll improve your cash flow because you can establish budgets and stick to them. And you can take advantage of vendor discounts automatically. Payroll becomes a snap. Money Matters takes care of computing taxes, writing the checks, completing quarterly reports and more with just a keystroke.

"Money Matters Sounds Great — But My Business Is Different..."

Money Matters was designed around the notion that all businesses are unique, each with a different set of procedures and situations. Because it is so flexible, you can tell Money Matters how you prefer to work and it follows your lead, adjusting to your set of requirements.

Money Matters Can Do All of These Jobs for You, While You Run the Rest of Your Business:

Dozens of built-in formats to get you up and running right out of the box!

- Invoicing/Billing
- Check Writing
- Financial Reporting
- Receipts/Deposits
- Bank Reconciliations
- Automatic Payments
- Payroll Tracking
- Tax Information
- Inventory Control
- Job Costing
- Budgeting
- Personal Financial Management
- Sales Tax Calculations
- Credit Card Accounting
- Transaction Histories
- Expense Analysis
- And Many More

Money Matters Features:

► Easy Set-Up

- 14 pre-designed business categories to choose from
- Account set-up done automatically
- Short-Cuts section
- Easy to enter starting balances
- Customized account names, titles, numbers
- Provides for departmental accounting or subcategories

► Checkbook Management

- Automatic payments
- Automatic bank deposits
- Bank reconciliation
- Distribute transactions 20 ways
- Easy edit & void feature
- Tracks interest income

► Special Tasks

- Organizes tax information
- Profit & Loss
- Optional balance sheet
- Management reports
- Invoice analysis report
- SuperTrack reports
- Automatic budgets
- Provides on line account activity reports
- Detail retained for prior period adjustments

► Invoicing

- Prints three types of invoices
- Maintains up to the minute bank balances
- Calculates finance charges, due dates, and discounts automatically

► Customers/Vendors

- Holds up to 4,000 vendor & customer cards
- Evaluate vendor & customer accounts
- Track year to date figures
- Print mailing labels, lists & reports
- Store name, address & telephone numbers

► Bank Accounts

- Handles up to 15 bank accounts & credit cards
- Includes checking, savings, money market and more

► Forms

- 3 styles of invoices
- 2 styles of checks
- Receipts
- Mailing labels
- Supports laser forms

► Short-Cuts

- Pop up lists of vendors, customers
- Pop up list of accounts
- Speed Search feature
- Find key
- Macros for repetitive entries

► Reports

- Optional Balance Sheet
- Income Statement
- Check or Receipt Register
- Account Analysis Report
- Vendor/Customer Analysis Report
- SuperTrack Reports

FREE SHIPPING

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800-888-4437

Money Matters is the perfect accounting package for 1-5 person businesses. Spend your time doing what you do best.

BONUS OFFERS!

Get @Accounting™ FREE! When You Purchase Money Matters

@Accounting provides a seamless interface between Money Matters and Lotus 1-2-3 Release 2.2 allowing you to automatically send financial information to a complete spreadsheet including headings, formulas and your data. Save time and increase accuracy with this easy-to-use feature. You'll now have additional reporting capabilities such as budgeting and forecasting trial balances, trend reports, financial ratios, and more. *(A $ 95.00 Value)*

LIMITED QUANTITIES! FREE Business Week Business Advantage* When You Purchase Money Matters

An amazingly real big-business simulation system that puts you at the helm of some of the nation's top corporations such as Chrysler and Compaq Computers. You call the shots, make the tough decisions and take your place among the "Captains of Industry." *A $59.95 value!*

Limited quantities — offer good while supplies last.

Great American Software, Inc.

HW 1210 **Money Matters** 5¼" & 3½" **$89.95**

HW 1215 **@Accounting** ..... **$ 95.00**

IBM, PC, XT, AT, PS/2 or compatible, MS-DOS or PC-DOS, 2.1 or higher. 512K RAM and hard disk. Printer — parallel or serial, 80 or 132 column, impact or laser. 640K required with @Accounting.

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Pointing Devices for Normal Human Beings.

Ruggedly Crafted, Incredibly Accurate and Surprisingly Affordable.

Before the days when mice were associated with PC use, who could have imagined that a small electronic pad with a little ball would revolutionize the way we use computers?

But PC applications have become more sophisticated today and the benefits of high-speed, sophisticated pointing devices become more and more apparent. That's why the Logitech Mouse and TrackMan were designed.

Slick and precise, the Logitech Mouse and TrackMan deliver pinpoint accuracy and speed in a variety of applications. From spreadsheets to desktop publishing to CAD and other input intensive applications, you know you have the best with the Logitech TrackMan and Mouse. Try them with Logitech's Finesse desktop publishing software and you'll see how powerful your PC can be.

Speed Into the High-Tech Age with TrackMan.

Trackman is Logitech's high resolution stationary mouse. More than a trackball and more than an ordinary mouse, TrackMan is a pointing device in a class of its own, giving you all the advantages of mice and trackballs in one product. Rest your hand on TrackMan and you'll understand how revolutionary it is.

With a perfect fit for the human hand, TrackMan offers more ease, comfort and productivity than any pointing device you've ever used. You rotate the TrackMan ball with your thumb and click with any of the three buttons. Resolution is adjustable from 50 dpi to 15,000 dpi. TrackMan comes with a super-efficient set of utilities, including LogiMenus, which gives you a TrackMan-based menu system, and Mouse-2-3, which works with Lotus 1-2-3, Releases 1 and 2. Both LogiMenus and Mouse-2-3 will speed up your applications.

Imagine how fast you'll be able to move through a big spreadsheet or your desktop publishing work with TrackMan. And since it's designed to exactly fit the shape of the human hand, TrackMan will eliminate the discomfort that comes with using other non-ergonomically designed pointing devices. The three buttons give you great flexibility and the great utility software will make you so much more productive.

Besides, TrackMan uses less desk space than conventional pointing devices and is guaranteed to be compatible with all of your IBM or compatible software. With that kind of guarantee, comfort, and innovation, you can't pass up the Logitech TrackMan!

A Speedy Demon.

The Logitech Mouse, thoughtfully engineered and scientifically designed, uses 62% less desk space than standard mice. The Logitech Mouse is perfect for applications from CAD to desktop publishing because of its Intelligent MouseWare Utilities, that automatically adapt to your immediate needs. In fact, Logitech is so sure the Mouse will work with your software they guarantee it.

A best-seller. A top performer.

Included in the Mouseware Utilities is software that lets you adjust the resolution as low as 50 dpi for increased precision or higher than 19,000 dpi for extremely high speed, the LogiMenu mouse menus which speed up keyboard-based applications, and Mouse-2-3, which sets new levels of ease and performance for Lotus 1-2-3 Releases 1 and 2.

Also included is Pop-Up DOS, the ultimate mouse-based shell which replaces unwieldy DOS commands with a fast, modern point and click environment. Manage your system, run applications, and use the built-in calendar, editor, card file and calculator with just the press of a button.

World Class Desktop Publishing.

If you're like most first time Finesse users, you'll be amazed when you first load Finesse and see the easy-to-use pull down menus. Almost intuitively, you will open a document window, where you can import your word processing files with a single click of the mouse. Or, type right into Finesse. Either way, what you see on the screen is exactly what prints out. No more guessing. As if that is not enough, you can use your Logitech Scanman Plus to scan images directly into Finesse without ever leaving the program.

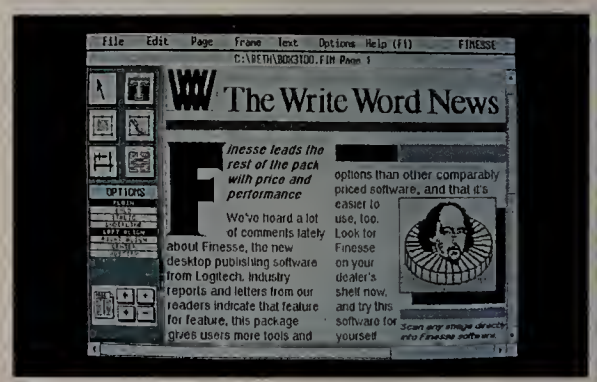
Imagine, your year-end report is almost complete. You find a picture that perfectly illustrates your point. Scan it and 10 seconds later that picture is part of your document.

Finesse's features include text wrapping around graphics, cutting and pasting, scaling and cropping, kerning and leading, variable gutter and column widths, on-screen rulers with cursor indicators, preview mode, and a variety of quick keys.

Supported printers include the Epson LQ Series; HP LaserJet, LaserJet Plus, LaserJet Series II, DeskJet, and PaintJet; IBM and Epson High Resolution Printers; IBM Proprinter; and PostScript Printers. Finesse also comes with 5 Bitstream type families.

With dozens of more great features, Finesse is gaining wide praise in the industry. "...Near perfection... you should rush out and buy it," says PC Magazine. "Simplicity, thoughtfulness and scanner support... well worth it," say InfoWorld. In fact, Logitech is so sure you'll love Finesse, they'll buy it back from you if you're not satisfied. And send you a T-shirt to boot. At this exclusive Tiger price, how can you resist Finesse?

- Create documents up to 99 pages
- Sharp, clear printing quality
- Wrap text around graphics automatically
- Automatic hyphenation



LOGITECH

HW 2905 **Logitech Serial Mouse**	**$85.00**
HW 2910 **Logitech Bus Mouse**	**$95.00**
HW 2915 **Trackman Serial**	**$99.00**
HW 2920 **Trackman Bus**	**$105.00**
HW 2925 **Serial Mouse w/Finesse**	**$129.00**
HW 2900 **Finesse Dual Media**	**$95.00**

TrackMan: *IBM PC, XT, AT, PS/2, 1 RS-232 serial or bus port, 256K RAM, DOS 2.1 or higher, dual floppy drive or one floppy drive and a hard disk.* **Logitech Mouse:** *IBM PC, XT, AT, PS/2 and compatible computers; DOS 2.1 or higher; dual floppy drive system.* **Finesse:** *IBM PC, XT, AT, PS/2 and compatibles, 640K RAM, DOS 2.1 or later (3.1 or later for Bitstream Fontware), one floppy drive and a hard disk.*

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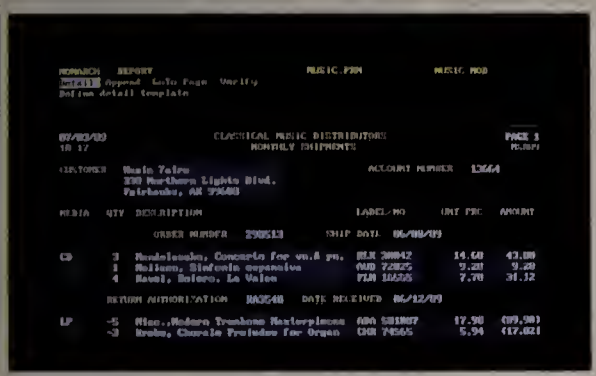
Now You Can Download Reports From Any Mini or Mainframe and Bring the Data Alive on Your PC!

Turns a Report File into a Ready-Made Database.

Consider for a moment the vast ocean of information that governments, corporations and other organizations around the world accumulate, store and manage. Every day, billions of bytes of new information are added to the pool. If handled with thoughtful care, this information can be a priceless resource.

The sheer volume of information demands a mainframe or mini-computer for data storage. But here's the paradox: All the best tools for data analysis are on the PC. PC users who need to get their hands on the data cannot gain access to it. They must sift through stacks of printed reports to find what they want. Now, for the first time, there's a remarkably intuitive new tool to help PC users bridge the data gap.



Monarch reads report files and extracts the data. Here, the extraction template overlays the report.

Existing Reports Become Valuable, Ready-Made Databases.

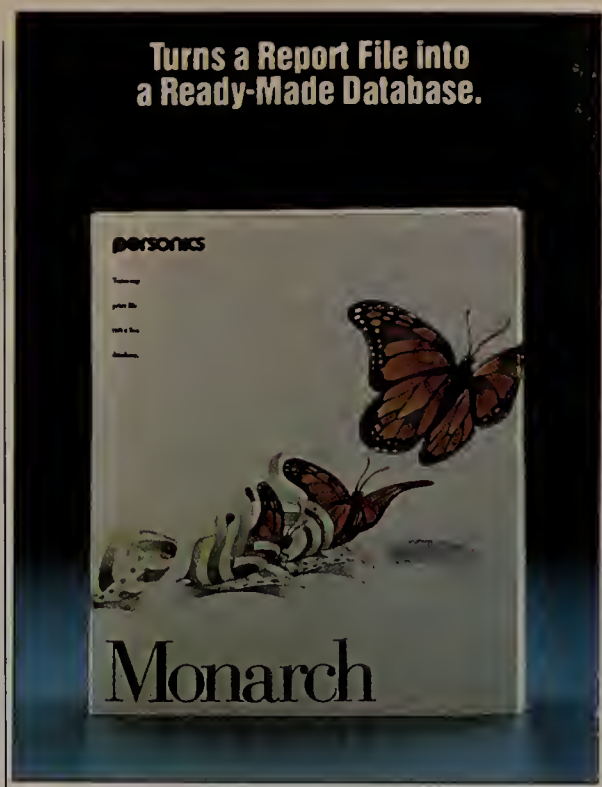
Monarch reads computer-generated reports and extracts the data! To understand the magic of Monarch, picture all the reports that come across your desk. All those cost summaries, transaction reports, customer lists, asset schedules, payroll reports and more. Think of flipping through all those pages trying to understand what's going on. Imaging trying to rekey all that data into your spreadsheet for analysis. With Monarch, the data comes alive.

Monarch can read any report downloaded from a mainframe or mini-computer. (Or generated on a PC.) It extracts data from the report file and serves it up any way you want. You can see it, sift it, select it, summarize it and send it out to your spreadsheet, word processor, graphics package or database manager. Monarch can read any report stored on disk, including ASCII files, TXT files, PRN files and SDF files.

CASE STUDY: The Agony of Printed Reports...

Suppose you've got a 500-page customer activity report that's been downloaded from your company's mainframe. You've been asked to analyze sales trends, but you don't want to spend hours digging through the printed report. Monarch allows you to automate the analysis by turning the report into a live database.

Here's how it's done. Simply load the customer report file into Monarch, quickly define a data extraction template, and then explore the report using powerful data analysis commands.



You can tell Monarch to show you all the sales transactions for a particular customer, product, salesman or region. Then produce crosstab summaries that show the field totals and record counts broken out in a variety of useful formats. Data and reports can be output on a printer, or exported to applications like Lotus 1-2-3.

personics

HW 1002 **Monarch** 5¼″ & 3½″ **$495.00**
IBM PC, XT, AT, PS/2 and compatibles with 512K. Hard disk recommended.

Instantly Calculate and Analyze Mortgage Rates, Present Values, Amortization and Variable Rates...

Calculate Swift Answers to Complex Financial Questions.

This speedy financial tool allows you to quickly enter information about anything from annuities to loan balances to amortization schedules — then, using a sleek interface, PercentEdge will calculate and present a custom analysis of any specific financial transaction.

Using PercentEdge, you can quickly develop alternative structured settlements to fit your client's needs. Or instantly calculate the present value of losses or gains during periods of fluctuating interest rates. Create an unlimited number of alternative financing options for any negotiated purchase. Great for determining the smartest way to finance a house, automobile — any investment.

Once you've got the numbers, you can crunch with flexibility and superior interactivity. Like calculating multiple balloon payments, unlimited "what-if" scenarios, and comparing several scenarios — simultaneously on your screen.

PercentEdge can also be used as a personal finance tool. For instance, an individual can estimate the maximum affordable price for property, evaluate a car loan, compare financial benefits of a variety of investments, or design a savings program for a child's education.

PercentEdge is the only financial software capable of operating in two modes. Run PercentEdge as a RAM-resident program for "pop-up" convenience, or as a full application for extensive financial work.

How Much Can I ACTUALLY Afford?...

Mortgages can be tricky. Now real estate professionals, as well as first-time buyers can — in seconds — calculate the maximum affordable price of a property. Just give PercentEdge the monthly budget, the interest rate, the life of the loan and the downpayment. Bang! You'll get the number. If there are special considerations such as multiple balloon payments or variable interest rates over the life of the loan, just enter it into the Mortgage Screen and PercentEdge instantly recalculates and gives you the revised values.

Wondering About Present Values?...

Questions about a pension plan, annuity or other time/value calculation? By leaving the appropriate boxes or cells blank on the Present Value Screen, and filling in the known data, you can compute rates, dollar amounts, and dates. You'll have an accurate answer in seconds.

Easy Amortization Schedules...

The Amortization Screen shows you how a loan will be paid back over time. These calculations can be helpful in determining figures for tax returns and financial statements. It simultaneously creates an amortization table to show the outstanding principal owed, the principal paid each period, the interest of each period, and the interest to date. The amortization table can be printed directly, saved as a text file, or saved as a Lotus®-formatted file for inclusion in a 1-2-3® spreadsheet.

Examined by KPMG Peat Marwick in accordance with AICPA attestation standards.

TIMESLIPS
CORPORATION

HW 1240 **PercentEdge** 5¼″ **$99.95**
HW 1245 **PercentEdge** 3½″ **$99.95**
IBM PC, XT, AT, PS/2 or compatibles with 320K.

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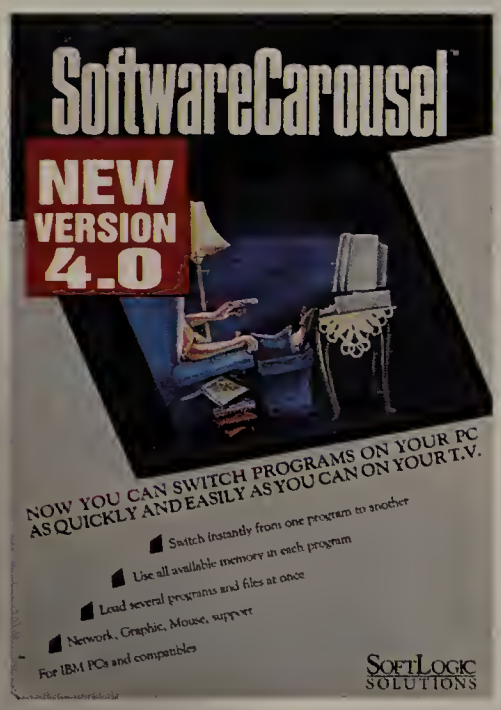
Open and Run Twelve Programs at Once — Just Switch Between Them! New Software Carousel Release 4.0!

Instantly Switch Between Up to 12 Different Programs — Software Carousel Eliminates Saving, Exiting, and Retrieving Forever!

An All-New Software Carousel!

Imagine switching programs on your computer as quickly and easily as you change channels on your TV! No more 10 step routines just to exit one program to work in another. Just switch and you're in your spreadsheet for work on the budget, switch you're in your word processor to zip off a memo, switch over to your database to add items to your mailing list, and then just switch back to your spreadsheet — to the exact spot you left off!



Software Carousel Release 4.0 allows you to load up to 12 programs when you begin work and simply switch between them all day long, or load several sessions of the same program, each with a different file, and snap back and fourth to work on several spreadsheets, reports, letters — anything you need — all at once.

Customizable. Compatible. And Highly Economical.

Not everyone will want Software Carousel to work exactly the same. So we've included a number of convenient ways to configure Software Carousel to suit everybody's needs and tastes.

Everything from the hot-key used to switch partitions, to colors on the screen, to the way menus appear.

Now With Print 'n' Run.

With this newest feature, Software Carousel becomes something more than an outstanding task switcher.

Print 'n' Run is a proprietary print handler designed for the special requirements of the Software Carousel environment.

It works by directing printer output from any application running in a Software Carousel partition into a configurable pool of Software Carousel memory. Print 'n' Run, simultaneously sends the output to the printer as fast as the printer can take it. With Print 'n' Run, printing programs finish in just seconds. And while their printers keep running, users can go on to other tasks in the same application, or even switch to a different partition running another application. No more wasted time waiting for printers. No more lost productivity.

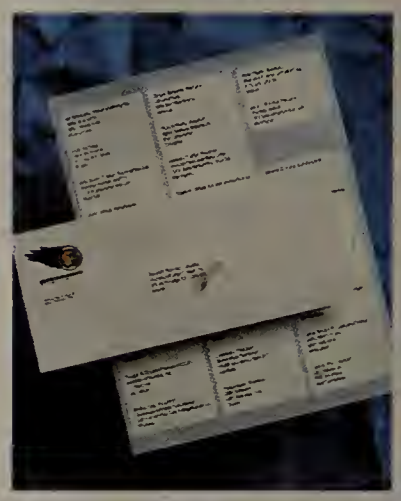
Simple to Set-Up, Even Simpler to Use.

- No complex installation required. Just type "Carousel" and load your software as usual.
- Automatically remembers your set-up and repeats it each time you start your computer.

Switch TO YOUR WORD PROCESSOR

Switch TO YOUR SPREADSHEET

Switch TO YOUR DATABASE



Makes the Most of All Your Memory.

- Use all available RAM with every program, no matter how many are loaded. Move from massive spreadsheet, to giant document to huge database in a blink.
- Compatible with Graphics, Networks, Mouse, etc.
- Makes full use of expanded or extended memory boards for lightning fast program swapping.
- Occupies as little as 11K RAM.
- Switch back to the first application, and it's just like you left it. Software Carousel can swap inactive applications to *any* type of RAM, or even use disk space as RAM.

It's Compatible with All Your Software.

If it runs on your IBM PC or compatible, it runs with Software Carousel. No modification or special files needed. No lost features or clumsy windows.

SoftLogic SOLUTIONS

HW 3300 **Software Carousel 4.0** 5¼" ... **$89.95**
HW 3305 **Software Carousel 4.0** 3½" ... **$89.95**
IBM PC, XT, AT, PS/2 or compatibles, with 256K.

FREE BONUS DoubleDOS!

RUN YOUR PROGRAMS SIMULTANEOUSLY — *The True Multi-Tasker For Your PC!*

Quick. What happens when you finish a lengthy document in your word processor and then spell check it. Or when you print huge reports, or run data communications? *You wait.*

Why Can't I Do Two Simple Things at Once?

The reason is that the PC is designed to handle one processing task at a time. Sure, it's unproductive — but you're used to it, right? With DoubleDOS, you can actually achieve true multi-tasking. Simply, quickly and without additional hardware or reconfiguring your system. Now you can continue to work while your spell-checker does its job, go on to the next project while printing large reports and finish up a memo while running data communications or "E-mail."

It's Like Having 2 Computers Instead of Just One!

Now your computer can do two things at once:

- DoubleDOS — it's the powerful, multi-tasking system.
- Runs the IBM PC software that you have now.
- Uses as little as 28K RAM.

Now you can stop wasting precious time waiting for your PC to finish one task before you can start another.

DoubleDOS is the time-proven multi-tasking program that lets you load and run two different programs at the same time — one program invisibly in the "background," while you work with the other program in the "foreground."

Double your PC productivity.

Print long reports at the same time you enter data.

- Spell check one document while working on another, or in an entirely different program.
- Conduct long database search and sort routines without tying up your computer.
- Compile programs "in the back-ground" while you edit/debug code.

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TIGER WAREHOUSE YELLOW SHEET

The Latest Software! The Hottest Hardware! If it's not here, call us — we'll find it!

Sorry, but because these prices are so low, shipping is not included.

AUTODESK
- [X] HW109 Autosketch 2.0 ..... $ 93.23
- [X] HW110 Autosketch Animator 1.0 ..... 245.30

BORLAND INTERNATIONAL
- [D] HW111 Paradox 3.0 ..... $456.50
- [D] HW112 Quattro Pro 258.50
- [R] HW113 Turbo C 2.0 ..... 96.80
- [R] HW114 Turbo C Professional Pack 1.0 ..... 168.08
- [R] HW115 Reflex 2.0 ..... 166.10

BRODERBUND
- [D] HW118 Memory Mate 3.01 (NCP) ..... $ 42.63
- [X] HW119 New Print Shop 36.96
- [X] HW250 Where In Europe is Carmen SanDiego 30.80
- [X] HW251 Where In Time is Carmen SanDiego 30.80

BUTTON WARE
- [X] HW252 PC File 5.0 ..... $ 78.65

CENTRAL POINT
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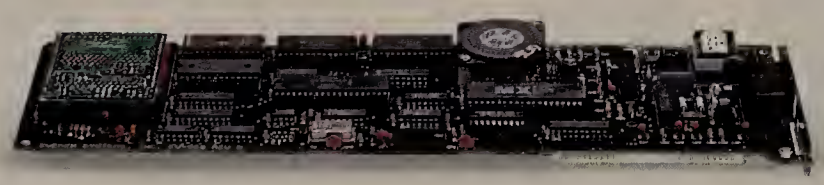

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Circle 73 on reader service card

Edited by ERIC BENDER

Creating Complete, Unified Presentations

Graphics Packages See New Competition

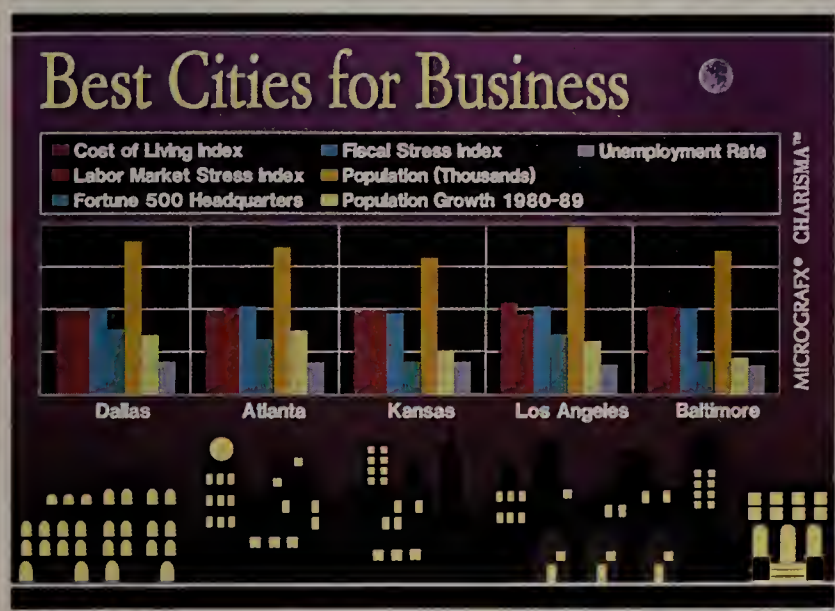
Windows Entries Challenge Today's DOS Leaders

The front-runner in PC presentation graphics, *Harvard Graphics*, will soon feel the heat from rivals who promise users a new genre of powerful, easy-to-use tools.

A crop of *Windows 3.0* offerings focuses on creating snazzy, soup-to-nuts presentations. Newcomers like Microsoft's *PowerPoint* and Micrografx's *Charisma* are catching the attention of *Windows* and non-*Windows* users alike. That, many observers say, makes presentation graphics ripe for a corporate takeover by *Windows*.

"To really run graphics you have to have *Windows*," declares Joan-Carol Brigham, an analyst with International Data Corporation (IDC) in Framingham, Massachusetts. She predicts dramatic growth in PC presentation graphics software, with U.S. shipments jumping from 394,000 in 1989 to 1.2 million in 1994 and with *Windows* products playing starring roles.

Windows is a natural for the graphics arena. "It's more than just look and feel," says Paul Grayson, chairman of Micrografx in Richardson, Texas. "It's a more robust environment." Phenomenal *Windows* sales—Dataquest projects more than 2 million copies will ship this year—will accelerate the changeover.



Windows 3 packages like Micrografx's Charisma want to elbow aside established graphics leaders like Harvard Graphics.

More Than Windows

Faster hardware and the proliferation of laser printers also contribute to heightened interest in graphics. So does growing user sophistication—once they become proficient in other applications, many managers are eager to make presentation graphics part of their computing arsenal.

Vendors also hope to attract hordes of graphics novices. With their friendlier environments, "*Windows* and [OS/2] Presentation Manager play a key role in that [process]," says Fernand Sarrat, head of IBM Desktop Software, which is expected to release a *Windows* entry late this year. Desktop publishing leader Aldus is also expected to introduce a *Windows* version of *Persuasion*, its Macintosh presentation offering.

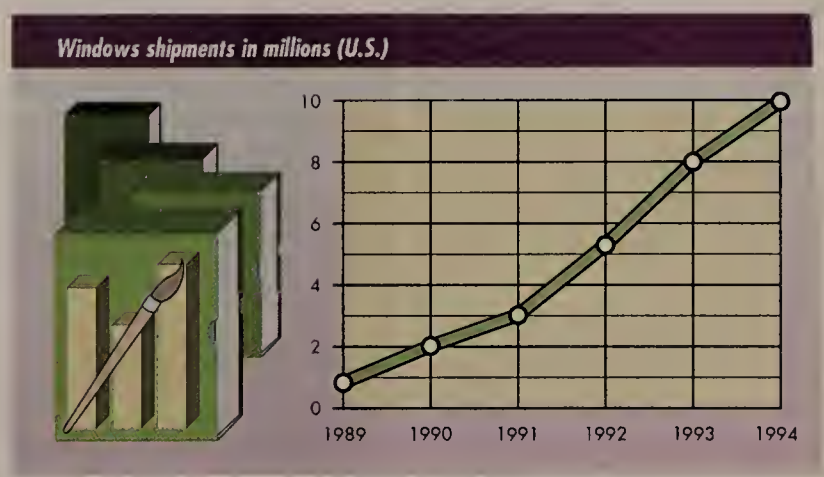
Unlike most current graphics packages, the newcomers are geared toward creating unified presentations. They include hand-holding devices such as templates, preselected color schemes, speaker notes, and built-in outliners. "The idea is to give users a more advanced starting point—to treat the presentation as a whole, rather than as individual charts and graphics," explains Kim Shah, Lotus's marketing director for graphics products.

Pushing Harvard's Strengths

Meanwhile, *Harvard Graphics* still enjoys a 40 percent share of an immature market. Software Publishing Corporation (SPC) estimates that only 8 percent of computer users regularly work with a graphics package. "Our number one problem is to expand that market," says Tess Reynolds, director of the company's graphics business unit.

Harvard Graphics 2.3, which shipped this spring, includes support for on-screen slide shows plus an application shell for switching between *Harvard Graphics* and other software. SPC will offer both *Windows* and OS/2 versions, but Reynolds isn't convinced that today's *Windows* packages represent a step up. "The appeal of *Harvard Graphics* has been its clear-cut menu," she says. "First-time users don't have to click on five different menus to figure out what they're trying to do." And despite all the hubbub about *Windows* products, IDC's Brigham predicts that large numbers of *Harvard Graphics* users will remain loyal. —*Roberta Furger*

Riding Windows' Coattails



Dotoquest projects Windows soles will more thon double in 1990, ond pockoges like PowerPoint ond Persuosion ore likely to go olong for the ride. Given the explosive growth of Windows, these presentotion grophics contenders moy hove o built-in edge over non-Windows stolworts.

Dot Matrix Printers Regroup Under Fire From Lasers

Sales of Impact Printers Now Falling; Vendors Move to Improve Speed, Fonts

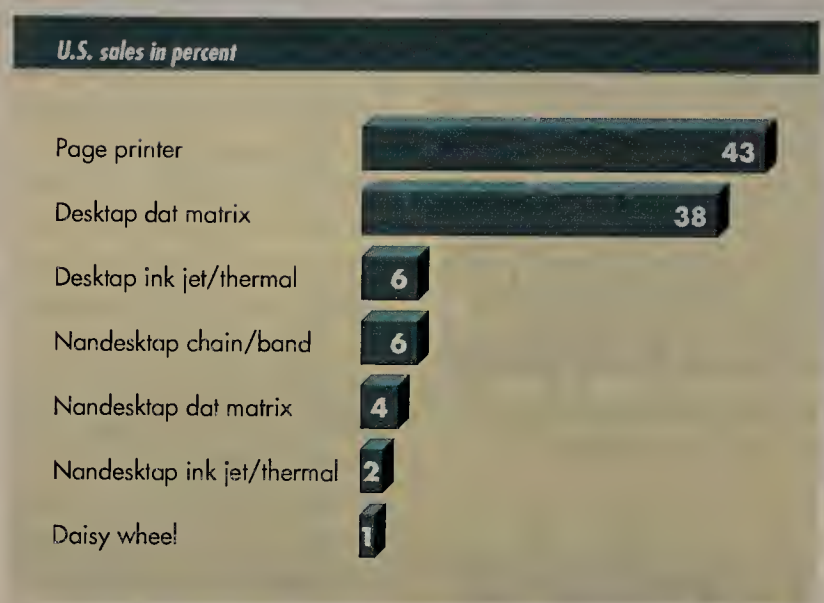
Across America, customers are walking into computer stores intending to buy dot matrix printers for their desktops but walking out with something else—maybe even one of the laser printers that now sell for under $1000. At the same time, offices are replacing dot matrix devices with more powerful laser devices that can be shared over a network.

Both of these trends are putting enormous pressure on dot matrix printer manufacturers to drop prices and add new features.

After climbing steadily to a high of about $3.9 billion last year, dot matrix sales will drop for the first time to $3.79 billion this year, according to BIS CAP International of Norwell, Massachusetts. By 1994 that market will decline 31 percent to $2.6 billion. At that point, the non-impact printer market (primarily comprising lasers but also thermal and ink jet devices) should reach $6.5 billion.

As volumes slowly drop, pricing on dot matrix printers is getting hammered. Additionally, vendors are working to boost speed, build in more memory, and offer more fonts—either built-in or on a cartridge. They also seek to exploit existing advantages, including rugged performance and the ability to print multiple forms at once.

Page Printers Outsell Dot Matrix Devices



Last year, sales of laser and other page printers surpassed those of dot matrix printers in the U.S. market, according to BIS CAP International. Page printers accounted for 43 percent of the $10.3 billion in total sales, while desktop dot matrix printers garnered a 38 percent share.

Dueling and Dwindling

Competition is fierce among more than a dozen significant suppliers. At the top, Epson America in Torrance, California, which created the dot matrix market with its MX-80 printer, struggles to fight off rival Panasonic Industrial of Secaucus, New Jersey.

Two years ago, Epson held 20.3 percent of the U.S. dot matrix market compared to Panasonic's 11.5 percent, according to InfoCorp in Santa Clara, California. Last year Panasonic boosted its share of the market to 19.7 percent, while Epson's share dropped to 18.3 percent.

"Panasonic just came out of nowhere," says Ed Pullen, InfoCorp's director of printer market research. The charge was led by Panasonic's 24-pin KX-P1124 printer, which sells on the street for as little as $250 and accounts for 30 percent of Panasonic's dot matrix sales.

"Panasonic found some wrinkles that Epson missed, such as the mass merchandising market," comments Charlie LeCompte, editor of *Printout* in Newton, Massachusetts. About 30,000 retail outlets now carry the Panasonic line, says Terry Shorrock, a senior product manager at Panasonic. Epson, however, had an *over*-distribution problem—selling through so many stores that dealer profits suffered. In the past few years, it has cut back its outlets from 15,000 to 4000, Pullen notes.

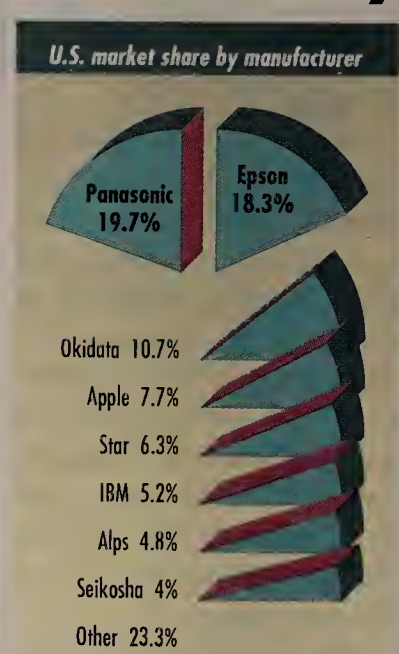
Last year, Epson released its first laser printer, the EPL 6000, and has pushed this product aggressively ever since. But it hasn't forgotten its dot matrix line, which includes about 20 models. "That's an indication of our responsiveness and commitment to our niche markets," says general manager Eugene Kunde.

Epson's best-sellers have been the 24-pin LQ-510 and the 9-pin LX-810. Kunde thinks he can lure more customers to Epson's well with the LQ-860, a 24-pin, $949 color machine.

Panasonic will entice customers with two-year warranties and may introduce its first color dot matrix printer, Shorrock says. The company also wants to improve font scaling and incorporate easier-to-use panel controls on future models.

Overall, dot matrix devices will remain a fixture in many niches throughout the computing landscape for years to come. Pullen predicts an increasing emphasis on sales to small offices, which will double from 15 percent of total sales today to about 30 percent in 1993.

Panasonic Overtakes Epson In Dot Matrix Printer Derby



Panasonic's big push into large retail outlets has paid off in leadership of the U.S. dot matrix printer market, according to InfoCorp. Panasonic now sells almost one-fifth of all such devices, edging out perennial front-runner Epson. Almost 5.7 million printers (both 9- and 24-pin) were sold in the U.S. in 1989.

But sometime in the 1990s, the dot matrix party will come to an end. Says Charlie LeCompte, "Companies will get tired of not making money and will drop out of the market."
—*Patrick Cole*

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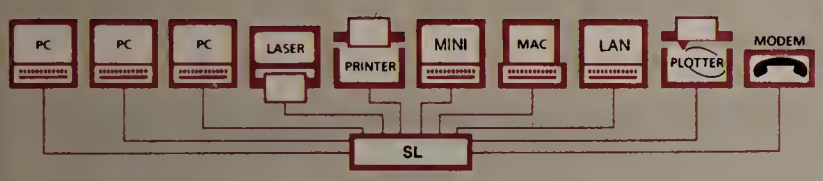

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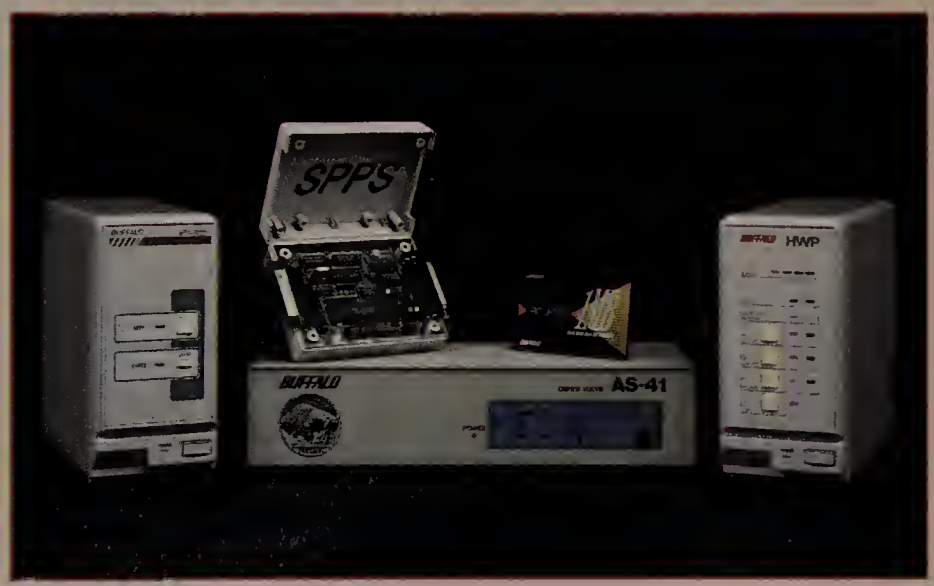

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Circle 215 on reader service card

PC Fax Spreads Slowly Despite Advantages

Progress Overcomes Earlier Technical Handicaps

PC fax plays well on networks, but you still need someone to route incoming faxes, notes Latest Developments' Jeff Gillard.

JACK SCHEKERMAN

PC fax boards suffer from the marketing equivalent of a paper jam—they have trouble delivering the message about the customer benefits of PC-based fax.

It's not that users aren't giving them a try. BIS CAP International expects U.S. sales of fax boards to reach 110,000 this year, up 57 percent over last year's. But compared to fax machines, "it's a very small market," says BIS CAP analyst Judy Pirani, who predicts that stand-alone fax machines will outpace boards by about 12 to 1 this year.

Three times as many PCs as fax machines have been installed worldwide, and the technologies are closely tied—one AT&T study shows 80 percent of faxes are originally generated on a computer. With a fax-equipped PC, you can send a file from your disk without leaving your application, or "scattergun" faxes to a group of people in off-hours when phone tolls are lower. You can view a computer-received fax before printing and produce a copy on plain paper. Also, PC faxes are sharper, since they need not be scanned first.

Progressive Pricing

Fax boards are also cheaper than stand-alone machines. That was true when GammaLink of Sunnyvale, California, introduced its first GammaFax for $1995 in 1985, and it's still so. A low-end GammaFax model now sells for $495, although other 9600-bps Group III faxes can exceed $1000. Boards that send at 4800 bps can be had for under $300, and cheap fax/modem combos are popular. In contrast, the typical office fax machine offers fewer features at around $1300, and prices rise to more than $2000 for models that run unattended.

This price gap widens further when it comes to network-fax gateways. A fax server XT, with multiple boards, can replace any number of machines and save time for any net user.

"The whole application of PCs to fax is still down the road," says Richard Gough, communications business unit manager at Intel's Personal Computer Enhancement Operation in Hillsboro, Oregon. "But technology is definitely on the side of the fax board."

So What's the Hang-Up?

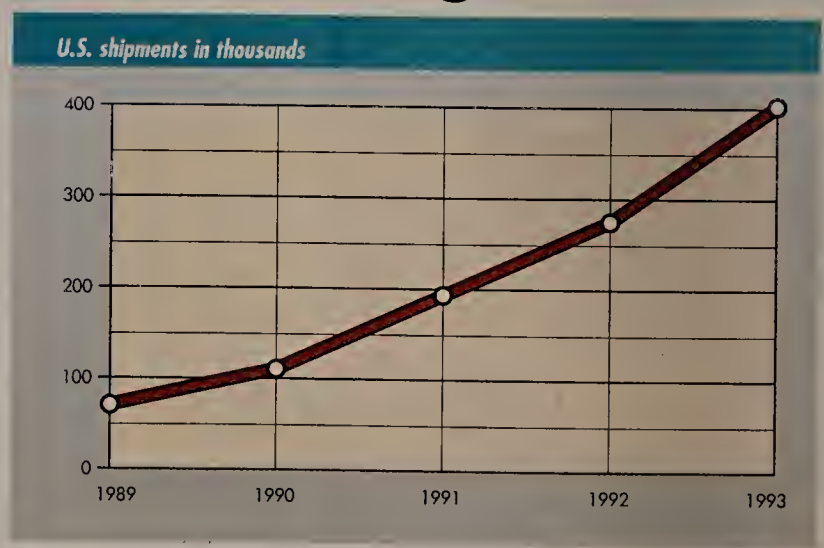
Fax machines remain much easier to use, and they can handle anything on paper (you need a scanner to do the same with a fax board). So although PC fax can do anything stand-alone fax can do, "fax boards augment fax machines, they don't replace them," says Bert Ranking, group product manager for The Complete PC in San Jose.

Some technical barriers have fallen. The better fax boards now handle transmissions smoothly in the background. And with a device that detects fax, modem, and voice traffic and switches between them accordingly, you don't need a dedicated phone line.

While vendors have emphasized single-user installations, fax boards will naturally move to networks. The biggest problem with a net is receiving and routing messages, says Bill Butcher, vice president of Hayes Microcomputer in Norcross, Georgia. "You need a fax manager to pick up the faxes and determine who they're for, which is a manual operation," agrees Jeff Gillard, systems integrator at Latest Developments of Toronto.

One problem that has plagued fax boards is the lack of standards—as a rule of thumb, no one's board works with anyone else's software. That problem is easing somewhat with the emergence of the Intel/DCA Communicating Applications Specification, which lets you send faxes directly from applications. More than 60 packages now support CAS, ranging from headliners like *PC Tools Deluxe* to *FAC-Sys* from Optus Software of Somerset, New Jersey, a *Windows*-based net product that uses text-recognition scanning to help route incoming faxes. Rival hardware vendors are reluctant to back CAS, but they are slowly yielding to pressure from software developers.—*Mark Henricks*

Fax Boards Plug Ahead



U.S. shipments of PC facsimile boards show steady growth, according to BIS CAP International. But stand-alone fax machines sell in far greater numbers—1.6 million this year, for example.

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dBASE IV 1.1 Ships—Finally

Will Users Embrace New Version?

Nearly two years after the initial release of a flawed *dBASE IV*, Ashton-Tate is shipping the fix. But with version 1.1 of the leading data base manager finally on the scene, will customers simply forgive and forget? Or will the sales momentum generated by products like Fox Software's *Foxbase* and Borland's *Paradox* overwhelm the data base kingpin? Most important, should users remain committed to the dBASE language?

The uproar in the data base management arena is compounded by differing views of *dBASE IV 1.0:* Users are far less critical than developers, many of whom trash it with gusto. The only thing the two groups agree upon is that Ashton-Tate *almost* blew it.

A Ride in Red Ink

Originally shipped in October 1988, version 1.0 was fat, slow, and bug-ridden. Ed Esber, Ashton-Tate's then-CEO, promised a rigorous reworking and a quick release of a standard edition, to be followed by a version tailored for the *SQL Server* being built by Ashton-Tate and Microsoft. Esber also showed developers a compiler that he claimed outperformed Nantucket's *Clipper 4.0.*

But version 1.1 development languished—and with it, work on both the compiler and the SQL edition. As a result, Ashton-Tate lost exclusive retail marketing rights to SQL Server, the linchpin of its grand corporate connectivity scheme.

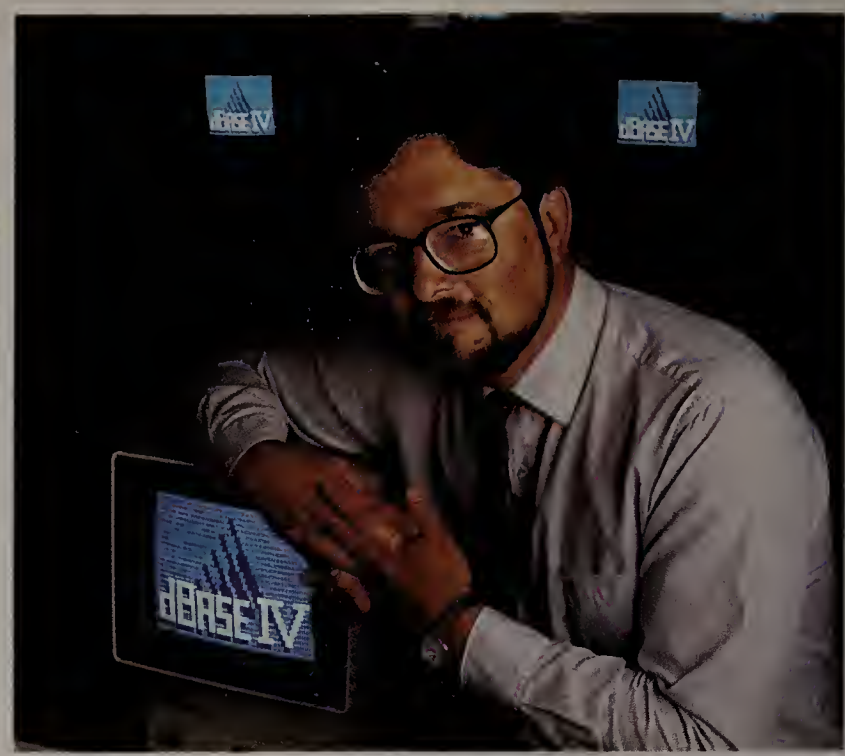
The delay has meant five straight quarters of losses for the Torrance, California, firm and has led to the resignation of nearly every executive associated with *dBASE*—including Esber himself. As version 1.1 neared its release date, purchases of other *dBASE* versions slowed, adding red ink. In the second quarter ended June 30, Ashton-Tate lost $12.6 million on revenues of $48.1 million—a steep slide from the first quarter, when it lost just $979,000 on $57 million of revenues. (*dBASE* products account for about 67 percent of total sales.)

A Stronger Standard Setter

Enhancements in dBASE IV 1.1

- Conventional-memory requirement: 450K as opposed to 516K
- Faster performance of overlay-dependent applications, particularly those using Central Center or menus and windows
- Users can balance need for speed against need for memory
- Lower memory demands on networks
- Simplified installation routine and easier modification of existing setup
- Disk caching option lets overlays be stored in expanded or extended memory
- Better record indexing for faster performance
- Expanded use of user-defined functions enables you to perform more actions with fewer keystrokes
- Improved implementation of Structured Query Language commands

Ashton-Tate not only addressed reliability and memory-use issues in the new release of dBASE IV, it added some significant new features.



While his company's confidence in Ashton-Tate was shaken, the new dBASE looks solid, says 3M Corporation's Paul von Fange.

MARK LUINENBURG

Analysts expect the bottom line to get worse before it gets better. Nancy McSharry of International Data Corporation in San Francisco figures that revenues could dip 20 percent this year, in part because copies of *1.1* will be given free on request to buyers of *1.0.*

Yet IDC's numbers show that Ashton-Tate's various *dBASE* versions still account for 40 percent of relational data base products sold and 50 percent of the installed base.

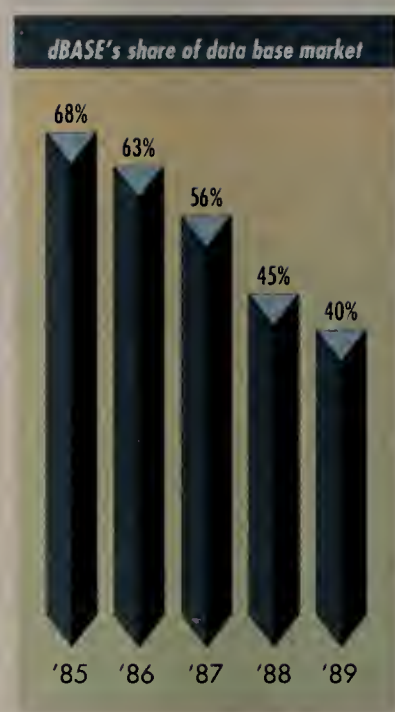
While its share has slid steadily, *dBASE* remains the relational data base standard and the odds-on favorite to stay so, says Bill Higgs of InfoCorp. In his view, competitors have profited as much as they can from Ashton-Tate's stumbling. With *1.1* shipping, the company's fate remains in its own hands, says Higgs: "They're the league leader, and it's their pennant to lose."

Is 1.1 Good Enough?

The future of Ashton-Tate and to a certain extent the vibrancy of the *dBASE* standard will depend upon the quality of version 1.1. This is more than a bug fix—Ashton-Tate rewrote the memory architecture (so that the software works in as little as 450K of available memory) and added performance-tuning options and language extensions. The result is much smaller, faster, and more reliable, the vendor claims. So far, users agree.

Release 1.1 looks solid, says *(see dBASE IV, p. 100)*

dBASE Loses Share in Data Base Arena



Despite a continuous loss of its share of relational data base unit sales to products like Foxbase and Paradox, the dBASE family continues to hold a commanding share of the market.

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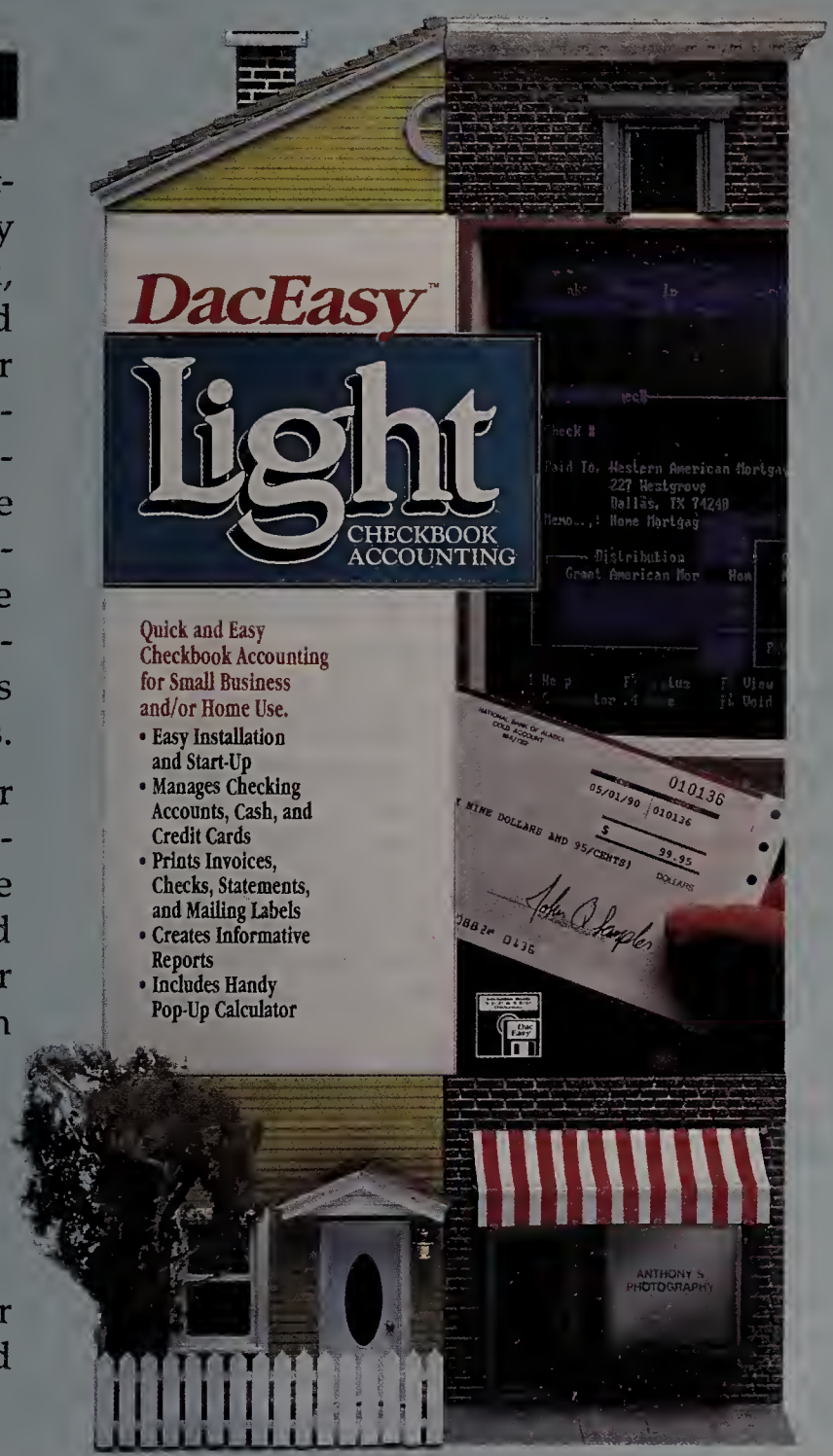

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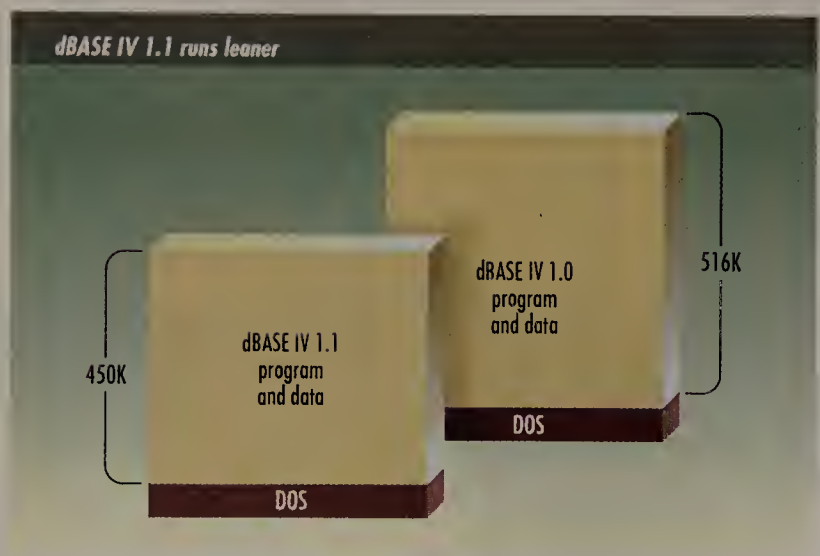


According to Ashton-Tate, dBASE IV 1.1 uses 450K of memory to hold the dBASE program, a typical dBASE user application, and an average amount of application data. That's a big drop from the 516K that dBASE IV 1.0 requires. The dBASE IV 1.1 program itself occupies a slim 264K—much closer to the 220K that dBASE III Plus occupies and far less than the 398K that dBASE IV 1.0 needs.

dBASE IV

(continued from p. 98)

beta tester Paul von Fange, a systems analyst for 3M Corporation in St. Paul who supports about 1000 *dBASE* users. About 200 users switched to *1.0* when it came out, and "there haven't been all that many complaints," notes von Fange. Others stayed with *dBASE III Plus* partly from inertia, partly from budget considerations, but mostly because of adverse press about *dBASE IV*'s bugs.

Tony Lima, dBASE Language Advisory Board member and president of Pacific Systems Design Workshop in San Francisco, observes that his corporate clients are generally far more tolerant than developers. Corporations "tend not to be very vocal, but that's where Ashton-Tate makes its bucks," Lima says. "Right now, there are lots of purchase orders for *dBASE IV* that everyone just left on the shelves, waiting for *1.1*."

Developers Departing?

If their clients are so unconcerned, why do dBASE language developers pan the product so consistently? Some long-time dBASE devotees now ask clients who insist that they write in dBASE to release them from their warranties; they've come to prefer other development tools. But often this is because of Ashton-Tate's inability to keep its product current or provide adequate developer support, explains Les Squires, president of Word Jenny in Wellesley, Massachusetts.

On the other hand, most developers quickly point out that each leading data base product has its own strengths, that purchases of software tools are not mutually exclusive, and that corporate customers increasingly use whatever is appropriate. "When someone asks me 'Should I buy *Clipper* or *dBASE*,' I tell them: 'Buy both; you need both,'" Squires remarks. "Why buy only a Phillips screwdriver or regular screwdriver? You need several tools."

Von Fange says that his end users face less rigorous needs than developers and weren't put off by version 1.0's admitted slowness and large appetite for conventional memory. He expects another couple of hundred users to move to *1.1*. But he adds that confidence in Ashton-Tate has been shaken.

Wall Street is even less favorably disposed toward the company, reports analyst Bahar Gidwani of Gidwani & Co. in New York City, although he doesn't share that view. Many analysts expect Ashton-Tate to be acquired or to slowly devolve into a second-rate power. But the company's stock, which declined by a quarter of its value to 9⅜ this year, jumped a point and a half on news of *1.1*'s shipment.

Even should Ashton-Tate fall, the dBASE language will not only survive but prosper, maintains Gidwani. Most analysts and developers agree.

Altered Vendor Vision

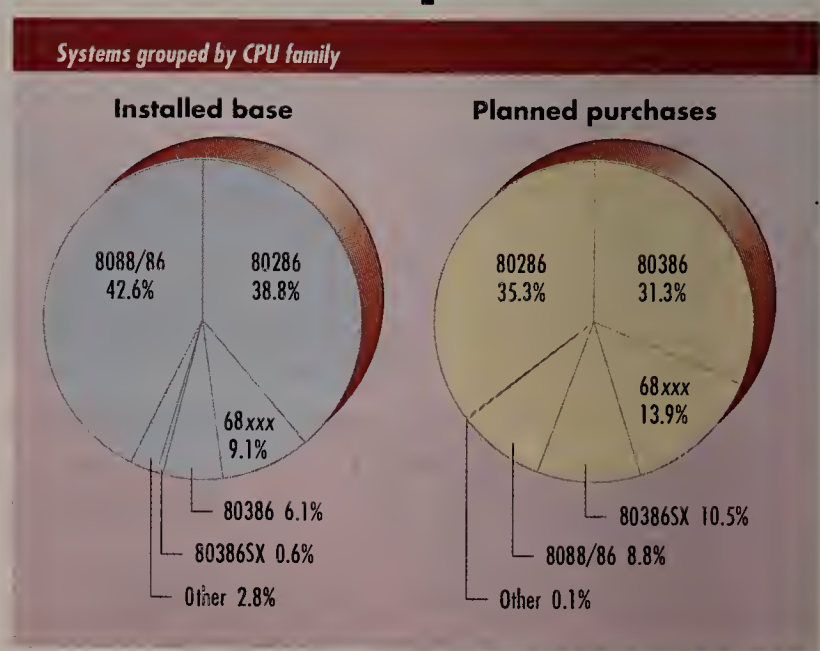
Bill Lyons, Ashton-Tate's new president and COO, isn't leaving it to chance. He has brought in veteran IBM development executive David Proctor to run the data base division. Lyons also has shifted development staff over to technical support to closely monitor and quash any bugs that appear in version 1.1. He pledges a steady stream of maintenance releases. Moreover, Lyons promises that the *SQL Server* edition will enter beta testing soon, followed within a reasonable time by the compiler and Macintosh and *Windows* versions.

Ashton-Tate will become profitable sooner than people think, says Lyons, because version 1.1 will jump-start the product category. Contrary to past corporate philosophy that begrudged *dBASE*-compatible packages' every sale, "this isn't a zero-sum game," he adds. "A reliable, stable product will reinvigorate the category and give people confidence in *dBASE*, and all will grow. We just expect to grow faster than others."

Longtime observers tend to agree with him, pointing to the huge installed base of *dBASE* applications and training—and the lack of a competitor strong enough to overcome this lead. Concludes IDC'S McSharry, "I think they can ride it out." —*Mike Hogan*

Patrick Cole is a business writer based in Los Angeles.

A Slow Shift Up in PC Power



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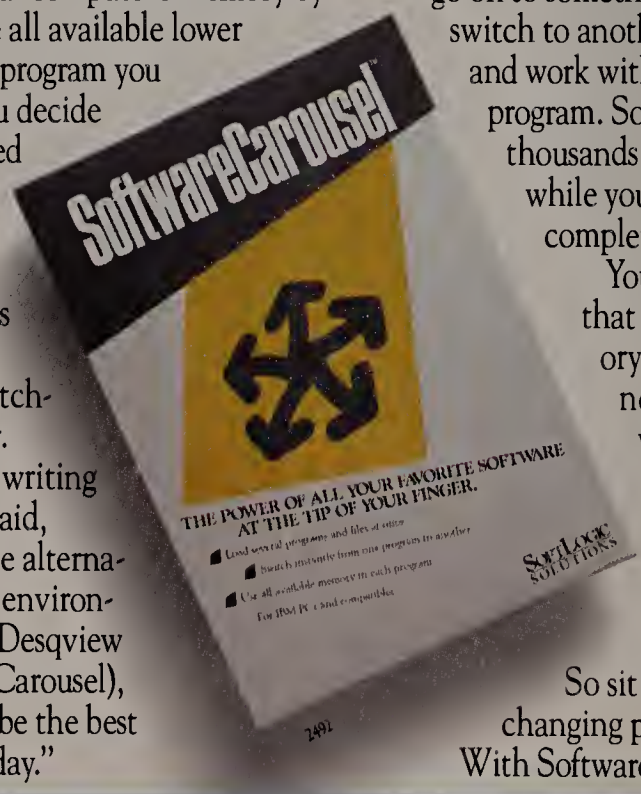
Garry Ray, writing for PC Week said, "Of these three alternative operating environments (OS/2, Desqview and Software Carousel), Carousel may be the best choice of the day."



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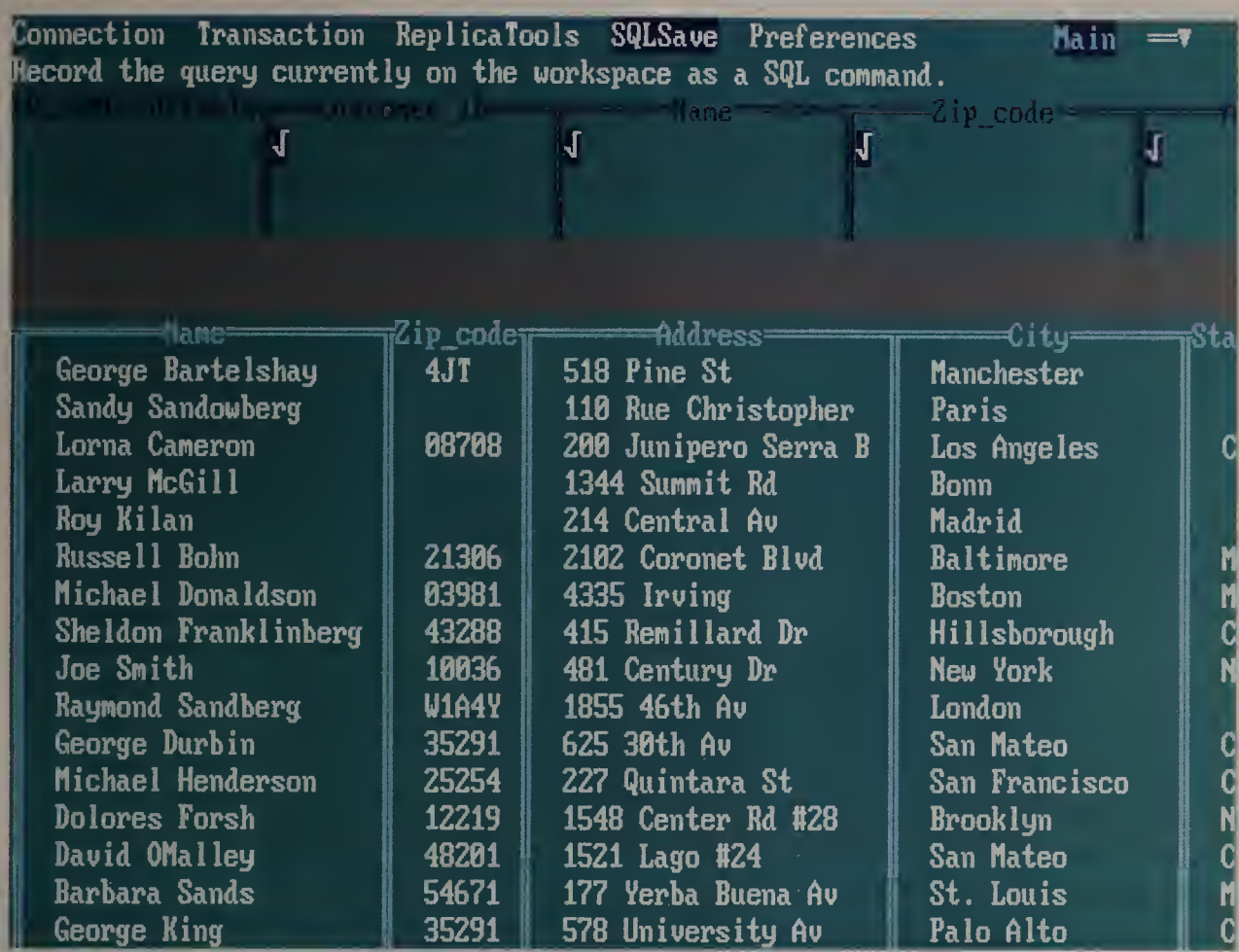
Paradox Muscles Up

Borland's three-pronged attack places Paradox 3.5 firmly in the league of the corporate heavyweights.



Aside from performance improvements, the big addition to Paradox 3.5 is its built-in hooks to the optional Paradox SQL Link. When SQL Link is hooked up, a new SQL menu group appears.

Eric Brown

From its inception, *Paradox* has been sold as an easy-to-use, even stylish application for managers rather than data base gurus. But once these managers learned query by example (QBE) and explored programming in *Paradox*'s PAL, they wanted more.

As PAL applications became more complex, users found they needed better performance. As *Paradox* took hold in corporations fed up with waiting for Ashton-Tate, there came a growing need for connectivity. And as dBASE developers moved over to PAL, there was a greater demand for development power.

Borland has addressed all these needs with new products that give *Paradox* more muscle for its growing role as a corporate data manager. To boost speed, Borland gives us *Paradox 3.5*. For connectivity, you can call on *Paradox SQL Link*, a $495 add-on that lets *Paradox 3.5* users access data on the top three SQL data base servers. And for development muscle, Borland is upgrading *Paradox Engine*, its library of C calls for manipulating *Paradox* data.

Like its rival *DataEase*, *Paradox* is now in a better position to lure disgruntled *dBASE* users. Although *dBASE IV 1.1* has finally shipped, the *dBASE* SQL connection is not expected until 1991. Meanwhile, Borland and DataEase offer SQL front ends today. (See *Product Outlook* for a look at *DataEase SQL* and "Four SQL Data Bases: Mainframe Muscle in a PC Package" for more on SQL data base servers and front ends.)

Paradox 3.5: VROOMMing Ahead

The latest version of *Paradox* looks like *3.0*, but it's quicker. The main boost comes from VROOMM (virtual runtime object-oriented memory management). VROOMM destroys the barrier between the memory space that programs use for overlays and the space above it that's allocated to data. VROOMM uses small, modular overlays and dynamically reallocates as needed the amount of RAM assigned to data and overlays. If you need more room for data and applications, for example, the overlay area decreases. Also, VROOMM frees up an average of 50K of conventional memory—good news for network users.

The result is top speed, especially during indexing and sorting. On a 286 PC with 1MB of RAM, Borland claims sorts are 50 percent faster than with *Paradox 3.0*. In addition, using a built-in DOS extender called TurboDrive, users of 286, 386, and 486 machines can tap up to 16MB of memory, further boosting speed. Thanks to TurboDrive, the 80386-specific *Paradox 386* is being phased out.

Aside from improved performance, there are only a few enhancements worth noting. PAL programmers can now place variables and functions directly in forms and reports as calculated fields. Also, there are links for up to nine tables (rather than five) in multitable forms. And Borland snuck the price up from $725 to $795.

Paradox SQL Link: Simultaneous Access

SQL Link is an add-on to *Paradox 3.5* that lets users access SQL data base servers from IBM, Oracle, and Microsoft. You load a single module that accesses all three server types—and all at once if you so desire. For example, you

can copy a table from *Oracle Server* to *SQL Server* with a brief stop in the intermediary *SQL Link*. Thus *SQL Link* can act as a conversion program between SQL dialects.

To get started, you set up a configuration file that automatically opens access to any of the attached servers. *SQL Link* then makes replicas of all the tables to which you have access and copies them to *Paradox 3.5*'s traditional Table area. The replicas contain the field and structure of the remote tables, minus the data, speeding up queries involving remote tables.

Because *Paradox* and SQL are both set oriented (rather than record oriented like *dBASE*), the QBE translations to SQL are straightforward. *Paradox SQL Link* demystifies SQL data by making a SQL table appear like any other. As you highlight each table in *Paradox 3.5*, a colored flag identifies its type. You can even perform *Paradox* menu operations, such as retrieving, updating, inserting, and deleting via QBE, on remote SQL tables. *Paradox 3.5* provides special menu options for remote table operations, but they remain hidden unless *Paradox* senses the presence of *SQL Link*.

There are some limits to remote operations, however—you can't call on QBE extensions, and you can't use set-level queries, such as "Give me everybody who bought none of our 1989 products." Also, the only way to join two disparate tables is to combine them into a local *Paradox* table.

SQL Link supports each server's security tricks and dialect enhancements, including *SQL Server*'s performance-boosting stored procedures. Additionally, *SQL Link* provides its own security code, which you can use together with or in place of the servers'.

You can embed SQL in PAL programs (a handful of SQL-specific commands and functions have been added), but it's doubtful that many PAL programmers will be writing critical transaction processing applications. Rather, *SQL Link* is designed primarily for managers who need occasional access to corporate data via QBE. Because PC-based SQL servers have barely made a dent in the marketplace, Borland expects that many initial customers will be using *SQL Link* to access UNIX-based Oracle servers. *SQL Link* is written for any Oracle server, but it's up to the user to iron out the remote links via modem or IRMA board.

Paradox Engine 2.0: Windows and OOP

Meanwhile, Borland is aggressively pushing *Paradox Engine*, a development library that lets C programmers write applications that tap *Paradox* data. The idea is to keep PAL simple for the casual corporate programmer while providing a powerful development environment for professionals who work in C.

With version 2.0, Borland is hitching its wagon to archrival Microsoft's *Windows 3.0*. By adding support for *Windows* Dynamic Link Libraries, *Paradox Engine* will let developers write *Windows* applications that call upon *Paradox* data. (All this is but a prelude to a true *Windows* version of *Paradox*, due in 1991.) Furthermore, version 2.0 adds an object-oriented programming layer that will let developers experiment until a true OOP version arrives in a year or so.

Overall, Borland's enhancements boost *Paradox*'s legitimacy as a powerhouse corporate data manager. *Paradox* may become *the* corporate data base of the nineties while old favorites stumble in the starting gates. ●

Eric Brown is the senior associate editor for PC World.

SNAPSHOT

Paradox 3.5
Paradox SQL Link 1.0
Paradox Engine 2.0

This trio of upgrades and introductions strengthens *Paradox* for the tough demands of the corporate world, adding speed, connectivity, and development support.

PARADOX 3.5

- **Faster performance with VROOMM**
- **Support for up to 16MB of memory**
- **Calculated fields in reports**

PARADOX SQL LINK 1.0

- **Front end links to IBM, Oracle, Microsoft servers**
- **Automatic configuration**
- **Simultaneous multiple server access**

PARADOX ENGINE 2.0

- **Developer support for Windows 3.0**
- **Object-oriented programming layer**

AVAILABILITY

September for Paradox 3.5 and SQL Link 1.0; fall 1990 for Paradox Engine 2.0

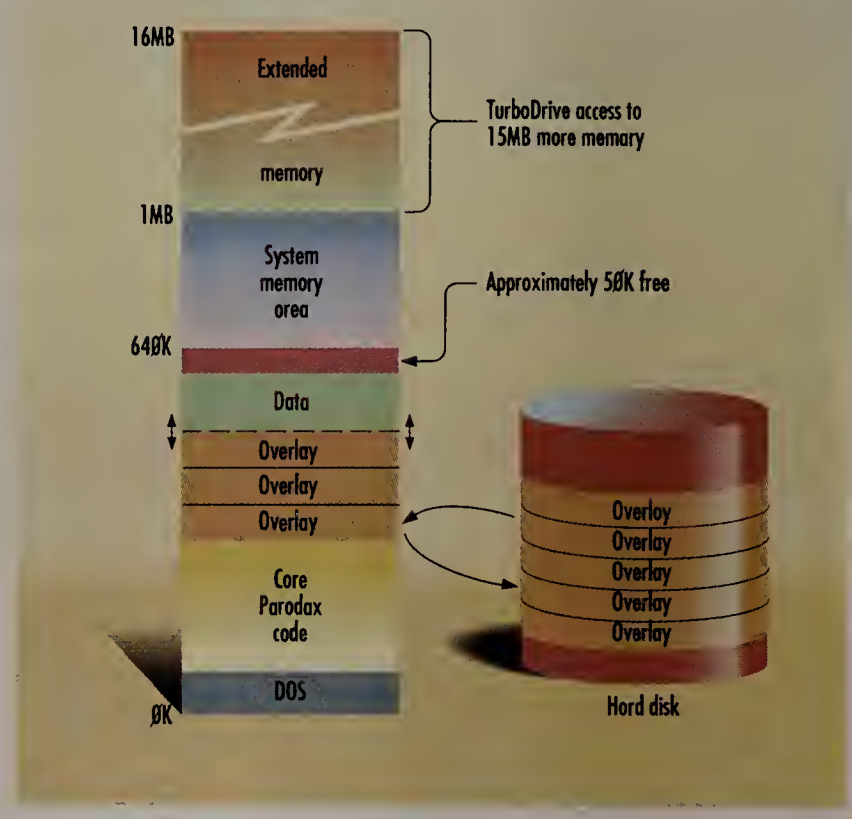
PRICING

Paradox 3.5 $795, Paradox SQL Link $495, Paradox Engine unavailable at press time

Borland Int'l, Inc.
1800 Green Hills Rd.
Scotts Valley, CA 95067
408/438-8400

Reader service no. 732

VROOMM: Speed, More Free RAM for Borland Programs



Like Quattro Pro, Paradox 3.5 uses VROOMM memory management to reduce the size of program overlays and swap them to disk when more room is needed for data and other memory-resident applications. No longer is there a firm barrier between the section of memory devoted to data and that assigned to overlays. The result is greater speed and an average of 50K extra conventional memory—just enough RAM to squeeze in a favorite TSR or a network driver.

HARRY AUNG

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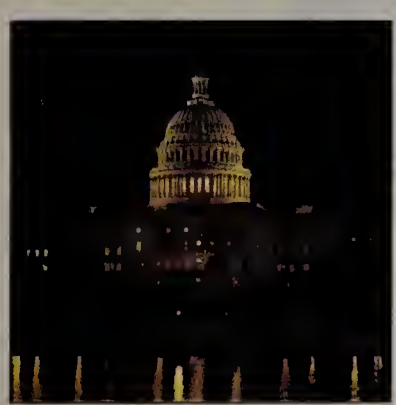
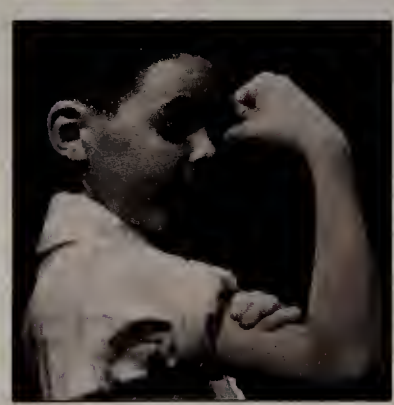

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Five lessons other companies have yet to learn about PostScript® printing.

1 *Genuine Adobe® PostScript.®* *You need a true Adobe PostScript printer. The Silentwriter2 290 printer from NEC. Some companies emulate PostScript with clone interpreters or add-on cartridges. Others have limited font capabilities. But that's not the way to produce eye-popping newsletters, or 3D charts. We've known this since we introduced our first Silentwriter LC 890 printer back in 1987.*

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3 *WYSIWYG Screen Fonts. As in What-You-See-Is-What-You-Get. Our printer support kit included with every 290 we sell includes software that lets you see all of the printer's 35 scalable typefaces before you print them out. Also included are diskettes that allow you to install the fonts on any Macintosh or under Microsoft® Windows™ in the MS-DOS environment.*

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C&C Computers and Communications

NEC

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A New Kind of Home PC

No doubt about it—Tandy wants to be your home-computer company. Tandy's 1000 RL is a savvy marriage of low-cost hardware and engaging software.

The 1000 RL's claim to fame isn't hot hardware but simple-to-grasp software that covers a wide range of home applications, from message taking to checkbook balancing to meal planning.

FRED STIMSON

Richard Landry

My home PC is a 386 clone with 8MB of RAM, a super-VGA monitor, a fax/modem combo, and a 150MB hard disk. I bought it the way many street-smart users do—I dialed up a mail-order vendor that offered the hottest features for the lowest price, then spent a month fixing glitches and trading out defective parts via express mail. Now I have a fully debugged system with blazing performance and a fan that drowns out the rap music blaring from my teenager's bedroom.

Problem is, nobody pounds the ivories on my industrial-strength screamer except me. So when Tandy offered me a preview copy of the new 1000 RL, I decided to see whether it would feel more at home than my business powerhouse. I brought it home, plugged it in, and stood back to watch. And guess what—it's been in quiet but constant use ever since.

Software Makes the Difference

Tandy touts the 1000 RL as a superior home machine compared with IBM's PS/1, but hardware specs don't tell the story. The 1000 RL includes a modest 9.54-MHz 8086 processor, 512K of RAM expandable to 640K, CGA graphics, and one 8-bit expansion slot. By contrast, the PS/1 sports a 10-MHz 286 processor and VGA graphics and can grow to include up to 16MB of RAM and three 8/16-bit slots.

Tandy's compromises were made in the name of price: The base unit with monochrome monitor and 720K drive retails for $750, compared with $1000 for a similar PS/1 (with 1.44MB floppy drive). A color model with 640K, 20MB hard disk, and 2400-bps modem goes for $1560, compared with $2000 for a 30MB color PS/1 with 1MB of memory. Tandy throws in two joystick ports and audio capabilities that cost $249 extra on the PS/1. Like the PS/1, the 1000 RL features a compact footprint, comes ready to run out of the box, and is virtually noiseless.

Still, the 1000 RL shines where the PS/1 falls flat—in bundled software. Whereas the PS/1's programs feature clashing interface styles, the 1000 RL boasts a unified *DeskMate* graphical environment with tools that make light work of common DOS tasks. It also includes 24 home applications, from an electronic message center to a check register that lets you see graphically where the money went.

All the programs operate with a point-and-click simplicity. And the proof is in the pudding: My family learned its way around the 1000 RL without any coaching from me, except on how to use the mouse. Tandy hopes the system will find a place next to the phone or in the kitchen where it will get constant use—rather than in a spare bedroom where it will collect dust.

A Home PC—For Whom?

If you're looking to start small and expand your system as you go, the 1000 RL isn't for you. While the PS/1's graphics and expandability theoretically give it the power to run *Windows*, the 1000 RL is strictly for memory-lean DOS programs or *DeskMate*-specific software. That includes many grade-school education programs and a stripped-down version of *1-2-3*, but not many other serious business programs. So it won't please people who buy a PC to bring work home.

But the 1000 RL isn't meant for people already sold on PC technology. It's designed instead to reach the vast majority of people for whom PCs remain a mystery. As it did for us, it might even create two-PC families.

Richard Landry is editor in chief for PC World.

SNAPSHOT

Tandy 1000 RL

Tandy redefines the home PC market with an inexpensive, family-oriented system that's eminently easy to learn and use.

KEY FEATURES

- **Easy user interface**
- **Bundled home applications**
- **Low-noise operation**
- **Serial, parallel, mouse, and two joystick ports; microphone and stereo headphone jacks**

AVAILABILITY

Immediate

PRICING

$750 to $1299 in standard configurations

Tandy Corp.
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Fort Worth, TX 76102
817/390-3011

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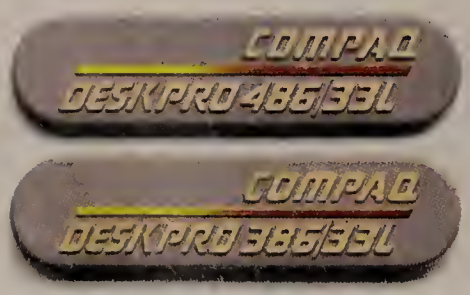
The new COMPAQ DESKPRO 486/33L and COMPAQ DESKPRO 386/33L Personal Computers are single-user PCs that deliver the utmost in power.

And 33-MHz 486 models of the COMPAQ SYSTEMPRO Personal Computer System strengthen its position as the network server without equal.



For individuals, our powerful new desktops extract the highest performance from Intel's 33-MHz 486 and 386 microprocessors. So you can run the most complex CAD/CAE, scientific and business applications faster than ever. You can also take advantage of SCO's UNIX operating system and Microsoft's Windows. Plus run the thousands of industry-standard software products available under Microsoft's MS-DOS and MS OS/2.

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For networks, the COMPAQ SYSTEMPRO Family now delivers the ability to employ one or two 33-MHz 486 or 386 microprocessors. It's power you can put to work in the broadest range of connected environments, from resource sharing to departmental database management.

Inside you'll find innovations like a 512-Kbyte ServerCache design, EISA I/O performance and drive array technology. Plus the ability to use up to 11 expansion slots and store up to 4.28 GB of data.

These innovations are complemented by the COMPAQ DESKPRO 386N and COMPAQ DESKPRO 286N Personal Computers, PCs designed with specific network features. Put them all together with Novell's NetWare, Microsoft's LAN Manager, SCO's UNIX or other industry-standard network or multiuser operating systems and you'll get the greatest performance to ever hit the networks.

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MAN LOSES HAIR WAITING FOR DOS

Anytown, USA—The unidentified victim was apparently among the millions of people who still think that DOS Backup and Copy commands are a safe and convenient way to back up their valuable hard disk data.

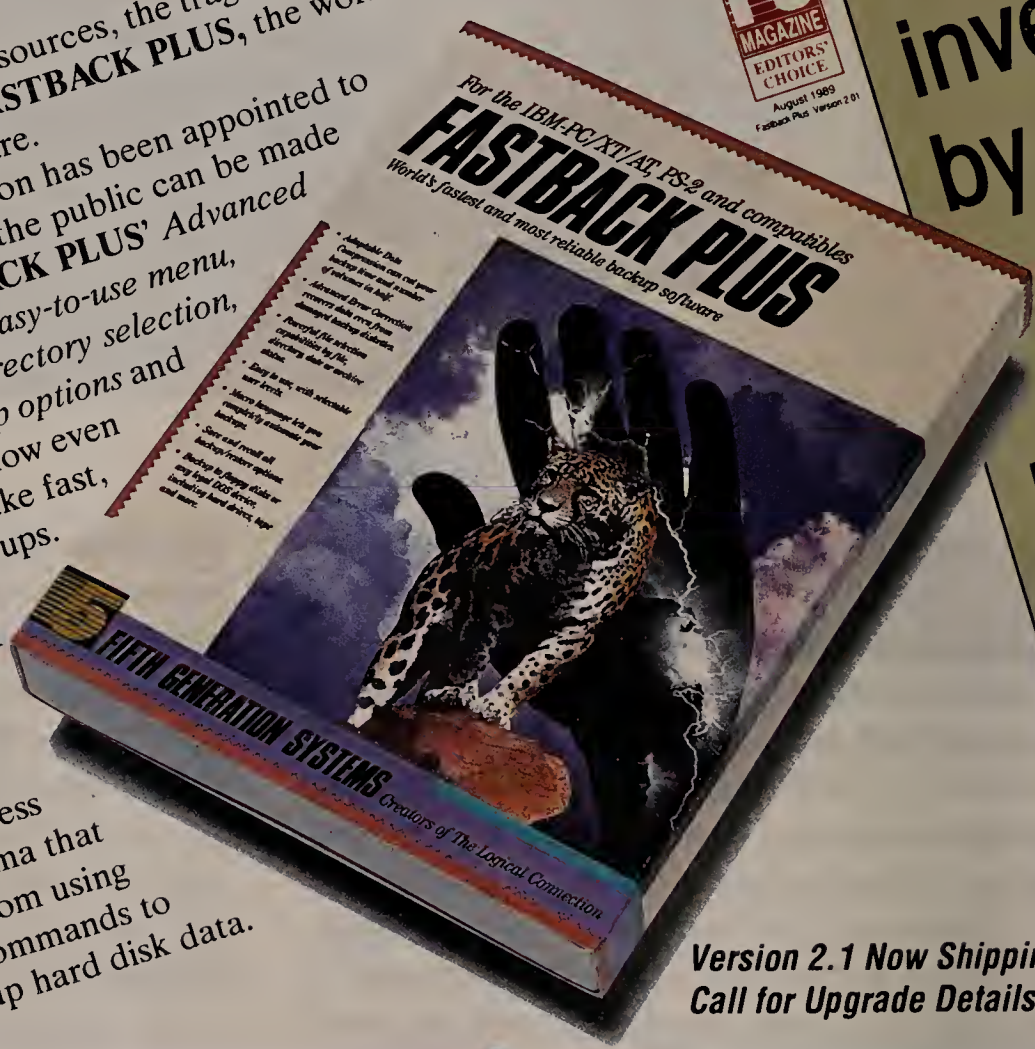
It is not known whether the shocking loss was a result of natural aging while DOS made the backup, or whether the victim pulled his hair out in frustration after discovering that a minor disk error had rendered his entire backup set useless.

According to reliable sources, the tragedy could have been averted if the man had been using **FASTBACK PLUS**, the world's fastest and most reliable backup software.

A special commission has been appointed to study ways in which the public can be made aware that **FASTBACK PLUS**' *Advanced Error Correction, easy-to-use menu, flexible file and directory selection, automated backup options* and other features allow even beginners to make fast, foolproof backups.

Public knowledge of these facts could ease the widespread stress and trauma that result from using DOS commands to back up hard disk data.

PC MAGAZINE EDITORS' CHOICE August 1989 Fastback Plus Version 2.01



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PRODUCT OUTLOOK

Edited by MIKE HOGAN

113 **PostScript Cartridge** Get the premier page description language straight from the source—and for less—with a plug-in cartridge from Adobe.

114 **AutoWord** Ease of use and abundant options make this file conversion program suitable for novice and expert alike.

114 **Epson LQ-860** Bored with black and white? A color dot matrix printer can energize your output without breaking the bank.

116 **NCR PC486/MC33, AST Premium 486/33** Two different paths to high-powered performance let you decide how far and how fast you want to go.

116 **QMS PS 410** This font-scaling laser printer from QMS offers high-end features at a low-end price.

118 **DataEase SQL** This SQL data base front end gives you access to three major OS/2 SQL servers—but at a steep price.

118 **Sharp PC-4741, PC-5741** These portables feature 640 by 400 resolution that's easy on the eyes, and one of them is a 386SX powerhouse.

120 **ReadRight for Windows, ReadRight Personal** OCR's software scans complex pages accurately and works with hand-held scanners.

120 **DrawPerfect 1.1** A run-time module lets you show a presentation to the work group at their desks.

122 **IRMAtrac Token-Ring Adapter/Convertible** DCA's versatile Token-Ring adapter plugs into a standard or Micro Channel bus, supporting twisted-pair cabling at 4 or 16 mbps.

122 **Desk Station, T24D/X** Plug your portables into a unit that converts them into desktops, or equip them to accept a modem.

124 **QEMM 5.1, Desqview 2.3** Two memory managers that pick up where Windows leaves off: the far reaches of high RAM.

124 **R:base 3.1** Streamlined to run in 480K, *R:base* is faster—and it's compatible with *dBASE*.

124 **25 Plus/Charisma MasterCartridge** It starts you off with a healthy helping of popular fonts, and you can add more as needed.

126 **Epson ES-300C** Epson brightens this 256-level gray-scale scanner with 16.7 million colors.

126 **PFS:Preface** Shield yourself from the painful realities of DOS with Software Publishing's efficient file management system.

128 **Charisma** Sharp, speedy business graphics geared to *Windows 3.0*.

128 **The Brick** Ergo Computing's 8-pound, 386SX portable handles the short haul from home to office.

128 **DesignView 2.0** A CAD package that learned from its first release and now supports *Windows 3.0*.

PostScript Cartridge

PostScript From the Source's Mouth

Better late than never: After years of trying to hold the line on PostScript pricing, Adobe has finally taken the bit in its mouth and independently released its page description language in a $495 cartridge that plugs into the HP LaserJet Series II, the world's most popular laser printer.

Besides being cheaper than PostScript clones like Pacific Data's $695 PacificPage, PostScript Cartridge is one-and-a-half to three times faster, Adobe claims. It includes Adobe's standard 35 fonts, ranging from Avant Garde to ITC Zapf Dingbats, and works with Type 1 and Type 3 downloadable PostScript fonts. Its *Font Foundry* software generates matching screen fonts for *Windows* and major DOS applications. The cartridge does not, however, work on other Hewlett-Packard printers or Series II compatibles.

Among the cartridge's most convenient features is a TSR-based program that lets you switch the LaserJet between HP's PCL and PostScript without leaving your desk or your application. Network users can rely on the TSR to examine the file to be printed and switch PostScript on or off as needed. The PostScript version 52.3 cartridge is downwardly compatible with the older PostScript drivers that are supplied with most applications.

If 35 fonts aren't enough for you, Adobe offers Adobe Type Cartridges with extra fonts for $395 each. Type Cartridge 1 includes display fonts such as Hobo, Bodoni, and Lithos. Type Cartridge 2 features Adobe's best-sellers, ranging from Garamond to Tekton Oblique. These additional cartridges plug into the second slot on the right-hand side of the LaserJet.

You'll need at least 1.5MB of printer memory to use Adobe's PostScript Cartridge. Adobe Systems Inc., 1585 Charleston Rd., Mountain View, CA 94039-7900; 415/961-4400, 415/961-3769 (fax).
—*Susan Lusty*

Reader service no. 735

Adobe's PostScript Cartridge plugs into the LaserJet Series II, and its Font Foundry generates matching screen fonts for major applications.

AutoWord

From Format to Format on Autopilot

If you've finally decided to give up *WordStar* for *Word for Windows*, or if you frequently must hand over documents to co-workers with word processing preferences of their own, you need a conversion program. Enter *AutoWord*, the word processing and graphics translator.

AutoWord translates files to and from over 20 popular word processing packages, including *WordPerfect*, *WordStar*, *Microsoft Word*, *Word for Windows*, and *Ami Professional*, as well as intelligent ASCII and *1-2-3*. It also handles TIFF, PCX, PIC, and other leading graphics formats.

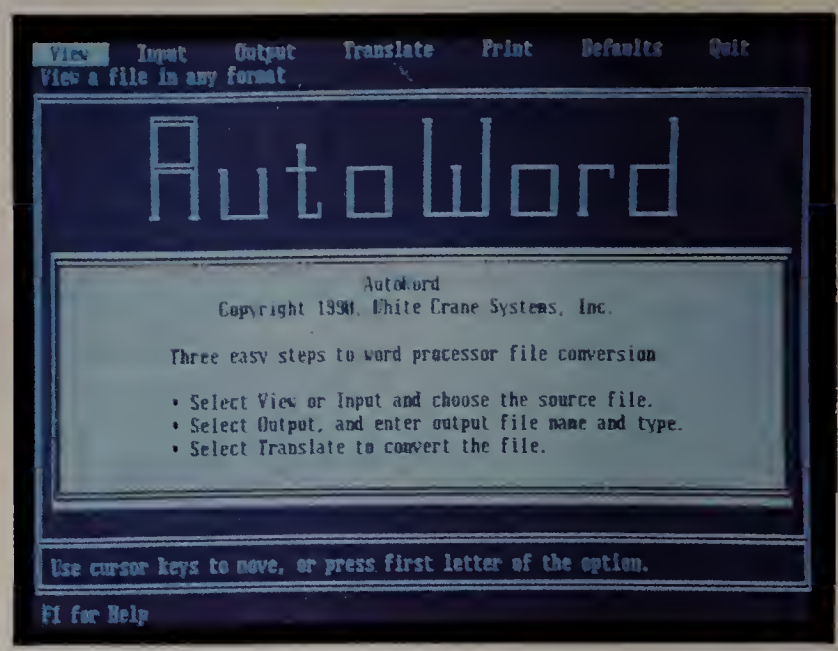
Whether you convert files often or occasionally, you want your conversion program to be quick and easy to use. You probably convert from your word processor to one other format most of the time, and you want that process as automatic as possible. You also want the ability to branch out as necessary.

AutoWord automatically detects the format type of an input file and converts it to the export format you chose as the default. You can configure the program to set up default subdirectories for input and output files and assign default output file extensions.

Novices can use either the keyboard or a mouse to select from *AutoWord*'s *1-2-3*–style menus and pop-up windows, even tagging multiple files or using wild cards. Advanced users can convert files singly or in batches direct from the DOS command line by supplying the input and output file names and the output format. *AutoWord* saves your bold, underline, margin, and other formatting, and it's very quick.

You can view word processing files and PCX, TIFF, WPG, and PIC graphics formats prior to translation. You can even print document and graphics files from within *AutoWord*, which includes driver support for Epson printers as well as for PostScript and LaserJet compatibles. Priced at $149.95, the program requires DOS 2.1 or later and 512K of RAM. White Crane Systems, 6400 Atlantic Blvd. #180, Norcross, GA 30071; 800/344-6783, 404/446-0660, 404/242-8712 (fax). —*Steve Bass*

Reader service no. 740



AutoWord recognizes the format of your input file and translates it to any of more than 20 word processing or graphics formats, including WordPerfect, WordStar, Word, TIFF, PCX, and PIC.

Epson LQ-860

A Dash of Color at a Dot Matrix Price

The 24-pin Epson LQ-860 prints letter-quality documents and graphics in seven colors at a resolution of 360 by 360 dots per inch.

Even if your simple, black-on-white printouts are adequate, you probably wouldn't mind adding a dash of color to your company logo, livening up those pie charts, or printing the loss portions of your spreadsheet in red. Epson's 24-pin LQ-860 not only handles graphics and letter quality printing, it can also make a seven-color impact at a fraction of the cost of fancier thermal color printers.

Given its compact size (18 inches wide, 16 inches deep, and 9 inches tall), light weight (22 pounds), and dot matrix operating costs, the LQ-860 turns the concept of a personal color printer into a reality. But it also serves as a versatile resource for a department or small business.

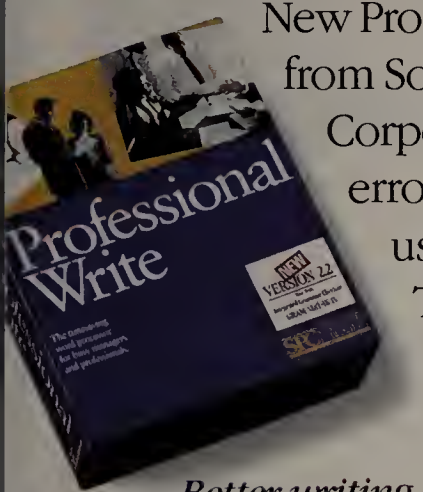
The LQ-860 deftly outputs 300 cps in draft mode and a respectable 82 cps in letter quality pica. Your word processing applications should do just fine with its resident draft, Roman, and sans serif fonts, but a multifont module is available for $73. Top resolution in graphics mode is 360 by 360 dots per inch, and while the output is hardly as glossy as that provided by an $8000 thermal color printer, you can console yourself with the LQ-860's $949 price tag. Also, at $28 for a 2 million–character ribbon, operating costs are definitely reasonable.

Epson includes its usual paper-handling extras. The friction feed loads single sheets automatically. For continuous forms, the tractor feed is a push design, but an optional pull tractor-feed mechanism is available for $73. Standard paper parking lets you switch to single-sheet letterhead or envelopes without having to remove continuous form paper. Top-of-form memory, microline adjustment, and a tear-off bar to help with invoices and other short forms are all standard. A single-sheet bin feeder costs $240. Epson America Inc., 23530 Hawthorne Blvd., Torrance, CA 90505; 800/922-8911. —*Mark Henricks*

Reader service no. 737

The software that made writing easier now makes your writing better.

The leading executive word processor now includes a custom integration of the leading grammar-checker – Gram·mat·ik™ IV.



New Professional Write® 2.2 from Software Publishing Corporation detects errors in grammar, style, usage and punctuation. Then recommends a way to correct them.

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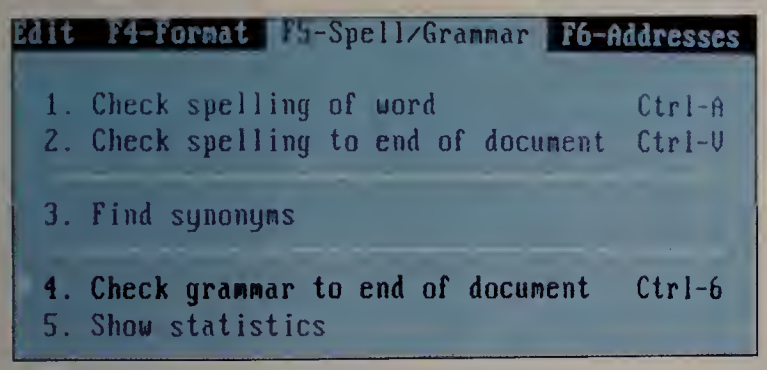
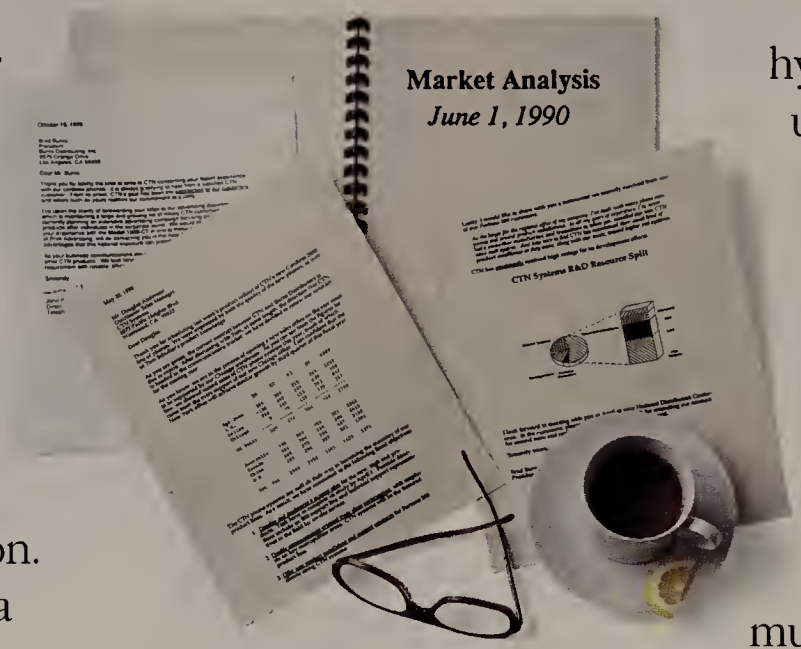
This new version also supports many more printers, including HP® LaserJet® III, LaserJet IIP, and DeskJet® Plus. And offers a new line of HP font support, as well as the 25 in One!™ III cartridge from Pacific Data Products.



Check your grammar as easily as you check your spelling.

That's not all. Professional Write 2.2 has lots of other new features – automatic hyphenation, unlimited document size, enhanced import and export of delimited ASCII files, and much, much more. It's also available in Professional Write's new LAN version.



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NCR PC486/MC33, AST Premium 486/33

Choose Your Fork in the 486/33 Road

Even after you've decided to go with a 33-MHz 486 for your CAD, technical, or file server application, you must decide just how far out on the cutting edge you want to get. AST's Premium 486/33 represents the less risky and expensive route, keeping to the beaten track of PC design, while NCR's PC486/MC33 takes the road less traveled.

AST uses its familiar Cupid-32 ISA-compatible architecture that places CPU, up to 4MB of memory, and all CPU-specific hardware on one modular board. The idea is to let you upgrade your CPU or even move on to the Extended ISA bus standard without having to scrap your system.

The Premium 486/33 lets you expand memory to 16MB on the system board and to 48MB by means of two optional 32-bit cards. A 5¼-inch, 1.2MB floppy drive occupies one of three externally accessible half-height drive bays. Inside the roughly 19-by-17-by-6-inch case are two more half-height bays.

The Model 115's built-in drive interface accommodates the 25ms, 110MB drive's embedded controller. One parallel and two serial ports are included, but you'll use one of the seven ISA slots—three 32-bit, three 8/16-bit, and one 8-bit—for an optional VGA adapter. An EISA upgrade to the motherboard costs $1250.

NCR's PC486/MC33 is built around the 486/33 but clearly oriented toward future expansion. The 486's power is complemented by a Micro Channel chip set that allows intelligent peripherals and the CPU to work cooperatively by swapping control of the bus.

Highly integrated, the PC486/MC33 has seven custom ASICs, including NCR's 16-bit Super VGA graphics on the system board. There's also room for up to 16MB of memory. You can boost system memory to 64MB with 16MB, 32-bit memory boards in the four dedicated memory slots. The NCR's dual-port interleave memory bus allows a peripheral to access memory at the same time as the CPU. Result: You run at zero wait state while multitasking, and there's an upgrade path for multiple processors.

Measuring only 17 by 15 by 5 inches, the NCR machine still gives you four free MCA expansion slots. A separate I/O slot is occupied by a SCSI controller. You'll also find six half-height and three full-height drive bays.

NCR's PC486/MC33 costs $15,995 with 4MB of memory, a 20ms 100MB SCSI hard drive, Super VGA graphics, and a 1.44 3½-inch floppy. The AST Premium 486/33 is $11,495 for the Model 115 with 4MB of memory, a 5¼-inch 1.2MB floppy, and a 110MB drive. —*Mark Henricks*

NCR Corp., Workstation Products Division, 1601 S. Main St., Dayton, OH 45479; 800/541-3333.

Reader service no. 738

AST Research Inc., 16215 Alton Pkwy., Irvine, CA 92713-9658; 714/727-4141, 714/727-9363 (fax).

Reader service no. 739

NCR's PC486/MC33 is a 486-based system that takes advantage of Micro Channel architecture, custom ASICs, and plenty of memory for maximum throughput during multiple operations.

QMS PS 410

This Laser Knows PCL and PostScript

QMS's PS 410 breaks new ground among inexpensive font-scaling laser printers. This 4-ppm, $2795 device offers not only all the familiar PostScript benefits but also a generous collection of 12 built-in scalable typeface families and even automatic printer emulation switching.

Because the PS 410 uses Adobe's PostScript interpreter, it works with standard PostScript drivers. But not every application includes such a driver, so the printer emulates an HP LaserJet Series II as well. No big deal? What *is* a big deal is that it samples incoming data on a job-by-job basis and switches automatically between PostScript and LaserJet Series II emulation. At best, other printers switch emulations via a software command; some printers require that you get up and switch settings or turn the printer off and on again.

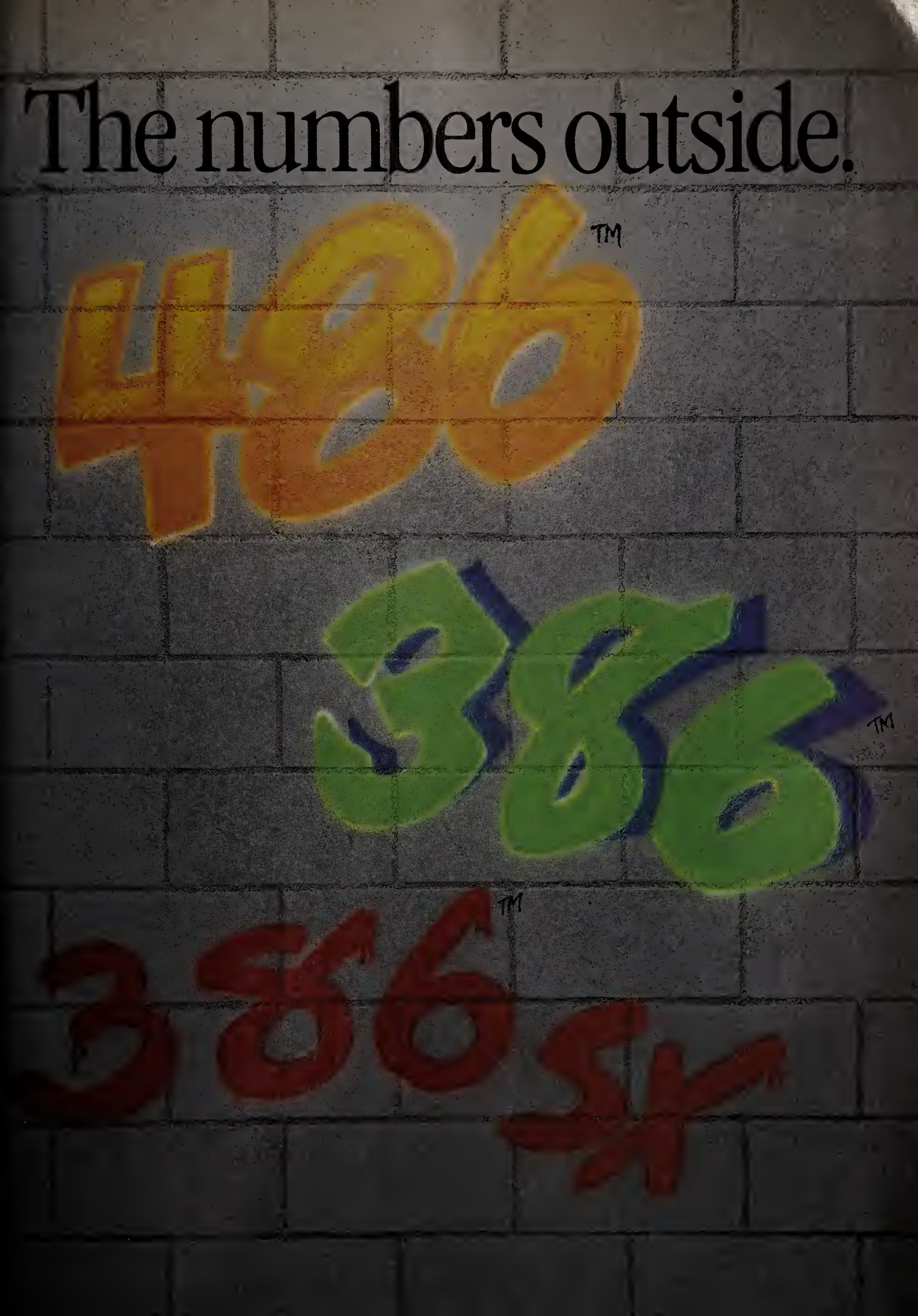
This capability makes the PS 410 ideal as a network printer for a small work group where print jobs from different applications with different printer drivers arrive one after another. The PS 410 supports three input ports (parallel, serial, and AppleTalk), all of which can be active at the same time, enabling networked Macs and PCs to use the printer.

A generous array of 12 built-in Adobe-licensed typeface families comes standard. (Typically, a family includes regular, italic, bold, and bold italic typefaces; most low-end font-scaling printers give you four or five families.)

You also get 2MB of RAM—more than enough for a full page of graphics—expandable to 6MB. A 50-sheet paper bin is built-in, and a 250-sheet tray is optional. Consumables can be changed with one cartridge. QMS, Inc., Sales and Marketing Support, One Magnum Pass, Mobile, AL 36618; 800/631-2692, ext. 922, 205/633-9064 (fax). —*Michael Goodwin*

Reader service no. 736

The numbers outside.



DataEase SQL

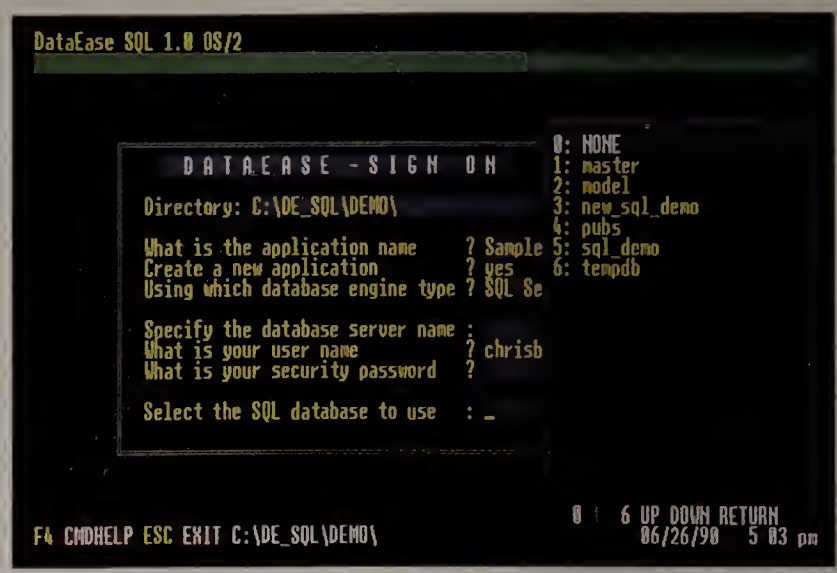
One Front End for Three Servers

Finally, SQL data base front ends are arriving. One of the first non-dBASE language competitors on the scene is *DataEase SQL*. A superset of the popular nonprocedural data manager *DataEase 4.2*, *DataEase SQL* can query either local *DataEase* tables or remote tables located on a networked data base server.

Like Borland International's *Paradox SQL Link*, *DataEase SQL* provides access to the three major OS/2-based SQL servers: Microsoft/Sybase's *SQL Server*, Oracle's *Oracle Server for OS2*, and IBM's Extended Edition OS/2 Database Manager. The *SQL Server* front end just started shipping, while modules for Oracle and IBM servers are coming.

You need to know on which server your tables are located. Once accessed, a table appears like any other in *DataEase*, and you can manipulate it via the familiar menus. Data from several servers and server types can be integrated in a single *DataEase* form. You query SQL data as you would local files, simply selecting SQL statements from the menus. *DataEase SQL*'s querying system is based on its fourth-generation language (DQL), a superset of SQL, so developers can embed optimized SQL statements.

Each query is optimized for the server to which it speaks, so, for example, you can exploit the greater efficiency of *SQL Server*'s stored procedures. Once you copy data to your PC, you can manipulate it with the full range of relational operators, joining data from different data bases. You also can use the program as a SQL converter, downloading a file from an IBM server, for example, and copying it into *SQL Server* format.



DataEase SQL, a superset of DataEase's nonprocedural data manager, lets you query tables in the three major OS/2-based SQL data base servers.

Pricing is on the steep side. *DataEase SQL* is expected to cost $995 for each developer's version, which includes an application generator, and $350 for each workstation version sans application generator. In addition, you must pay $1500 for the front ends to each type of server you want to access. *DataEase 4.2* will continue to be sold and upgraded separately; no upgrade plan for *DataEase SQL* has been announced. DataEase Int'l, Inc., 7 Cambridge Dr., Trumbull, CT 06611; 800/243-5123, 203/374-8000. —*Eric Brown*

Reader service no. 745

Sharp PC-4741 and PC-5741

Sharper Portables

Two new portables from Sharp ease both eyestrain and processing bottlenecks on those long road trips.

First, Sharp's PC-4741 gives you a razor-sharp, triple-supertwist display with 640 by 400 resolution in a near-notebook form factor. In addition to this double-scan CGA backlit screen, you get 10-MHz V40 power, 640K of memory, and a 29ms 40MB hard drive. The 8½-pound package, including a 2½-hour battery, measures only 11 inches square by 2¼ inches high.

You can boost memory to 1.6MB with a 1MB board in the proprietary slot, or you can use that space for an external CRT adapter. A second proprietary slot holds a 2400-bps modem or a serial port.

Meanwhile, thanks to a 20-MHz 386SX CPU, Sharp's PC-5741 brings far more power in a convenient package. You can expand the standard 2MB of memory to a robust 12MB by adding a proprietary memory board. A second proprietary slot holds either a 2400-bps modem or a serial port. A 10-inch double-supertwist VGA display (with 640 by 480 resolution) gives you 16 levels of gray, and the PC-5741's CRT adapter lets you add an external monitor.

The 14-pound weight of the PC-5741 includes a 2-hour nickel-cadmium battery. A second $399 battery pack screws onto the back, adding 4 pounds, 10 ounces, and another 3 hours of computing. An AC adapter is standard.

It's a little hefty for a notebook, but Sharp's PC-4741 gives you a double-scan CGA display, 10-MHz power, and a 40MB hard drive.

You'll pay $2699 for the standard PC-4741 with 3½-inch 1.44MB floppy, 640K of memory, DOS 3.3, and parallel, serial, and external 5¼-inch floppy drive ports. The 1MB expanded memory card costs $419. A 2400-bps modem is $449. The PC-5741 is $5595, including a 25ms 40MB hard drive and a 3½-inch, 1.44MB floppy. Sharp Electronics Corp., Sharp Plaza, Mahwah, NJ 07439; 201/529-9500, 201/529-8919 (fax). —*Mark Henricks*

Reader service no. 749

The computer inside.

Since buying a computer today is such a numbers game, here's a simple rule of thumb. Look for the 486™SX, 386™ or 486™ on the outside to be certain that you have Intel technology on the inside. From the company that invented the microprocessor. The company that has shipped over 19 million 32-bit processors. The same company that's investing over $1 billion this year to make sure the computer inside your computer has the technology, power and compatibility to take you into the future.

intel®

The Computer Inside.™

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Circle 109 on reader service card

ReadRight for Windows, ReadRight Personal

Scan Handlers Take Precise Approach

Two releases from OCR Systems speed optical character recognition by adopting a *Windows 3.0* interface and adding technology that more accurately captures text from pages that mix words with pictures.

ReadRight for Windows is a true child of the *Windows 3.0* environment, taking full advantage of its windowing interface and memory management capabilities to give you more perspectives on larger documents. The program exploits extended, expanded, and disk-based virtual memory as appropriate and lets you view work in progress through several open windows.

You not only see a complete image of the document being scanned but get window views of magnified versions of words that didn't scan correctly. You can type in your corrections before *ReadRight for Windows* completes its text file. Another window lets you adjust scanning contrast.

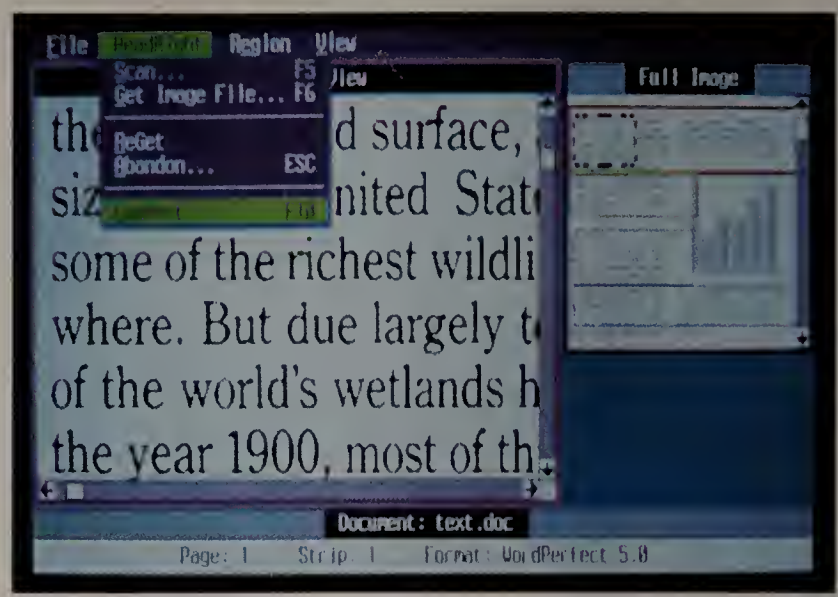
ReadRight for Windows' recognition capabilities are significantly more advanced than those of the DOS-only *ReadRight 2.01* (which will still be available). Among improvements are more options for setting the parameters by which the program recognizes what's text and what's graphics on a page. Better handling of degraded and italic text, the maintenance of original document formatting, recognition of a wider range of type sizes, and the ability to process double-sided pages or several pages consecutively round out *ReadRight for Windows'* features.

ReadRight Personal requires less memory and addresses the special problems of hand-held scanners. It has a graphical user interface that's quite similar to *Windows'* and gives you the same full-page and magnified views of your document for purposes of catching mistakes, setting contrast, and separating text from graphic regions.

ReadRight Personal runs in 640K of memory. In addition to having the full OCR capabilities of *ReadRight 2.01*, it has a number of features hand-scanner users will appreciate—including the ability to compensate for a wobbly hand that can't seem to scan straight down a page.

ReadRight for Windows costs $595. It requires *Windows 3.0*, DOS 3.0, and 4MB of RAM. *ReadRight Personal* sells for $249 and needs DOS 3.0 and 640K of memory. Both require a hard disk, and a mouse is recommended. OCR Systems, Inc., 1800 Byberry Rd. #1405, Huntingdon Valley, PA 19006; 800/233-4627, 215/938-7465 (fax). —*Mike Hogan*

Reader service no. 744



OCR Systems' ReadRight Personal smooths the way for hand-held scanners and even adjusts for wobbly scanning.

DrawPerfect 1.1

Once More With Free Run Times

With version 1.1's run-time capability, you can send executable DrawPerfect slide shows to your co-workers or clients.

In record time, WordPerfect has begun shipping *DrawPerfect 1.1*, an upgrade of its new drawing program.

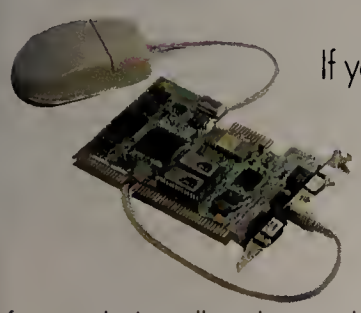
The principal reason for the quick release is a run-time module that lets you copy and distribute on-screen slide shows to work-group members. Thus, others can view your fully executable graphic presentations without loading a copy of *DrawPerfect*. Also included are advanced options for moving between screens in your desktop presentations, including effects such as blinds and diagonal sweeps.

Other new editing features include the ability to align objects on a page or in relation to each other—left, right, above, or below—and center them vertically or horizontally. You can add and delete points in objects and convert lines to polygons and back again. Close a line to form a polygon, and you can fill it with colors and patterns.

DrawPerfect 1.1 lets you group and ungroup objects to edit and move them more quickly. And you can import more types of files into your drawings, including EPS files and graphs from *1-2-3*. Support for 50 more printers has been added, bringing the total to 500. *DrawPerfect* requires DOS 2.0 or later and 384K of memory. Updates to the $495 program are available to registered users who send the title page of their version 1.0 manuals and $15 to WordPerfect Corp., DrawPerfect Update, 1555 N. Technology Way, Orem, UT 84057; 800/321-4566. —*Mike Hogan*

Reader service no. 751

VGAWONDER+ FASTER THAN VRAM



If you're about to buy a graphics card, make sure you don't get fleeced. And if anyone tells you that VRAM is the fastest, he's pulling the wool over your eyes. VGA*WONDER+** what ewe...er...you need.

While others follow, VGA*WONDER+* leads the flock with remarkable resolution, fabulous colors and outstanding value. VGA*WONDER+* offers an optimized architecture including fast 16-bit bus support and fast page mode memory which assures maximum speed...that's faster than VRAM and other VGA cards. Based on ATI's original award-winning VGA*WONDER** and available in 256K and 512K versions, you receive:

- High resolution non-interlaced and interlaced 1024×768 plus 800×600 graphics;
- 100% register-level compatible in all modes;
- Extensive drivers support including Windows 3.0*, Presentation Manager* and AutoCAD* Display List;
- Ergonomic 70Hz refresh rate in 1024×768, 800×600 and 640×480;
- Easy, switchless installation;
- Free Microsoft* compatible bus mouse;
- And much more.

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Circle 302 on reader service card

IRMAtrac Token-Ring Adapter/Convertible

A Two-Faced, Two-Speed LAN Board

Digital Communications Associates' LAN adapter, the IRMAtrac Token-Ring Adapter/Convertible, brings the same versatility to Token-Ring networks that DCA's IRMA 3 Convertible board brings to PC-to-mainframe links.

The IRMAtrac board can be plugged into any PC, XT, AT, or Micro Channel machine, since one edge has a standard 8-bit edge connector and the other has a 16-bit connector for Micro Channel systems. Just flip the appropriate edge downward, attach the standard or the Micro Channel slot cover/mounting bracket, and you're ready to slip the board into a free slot.

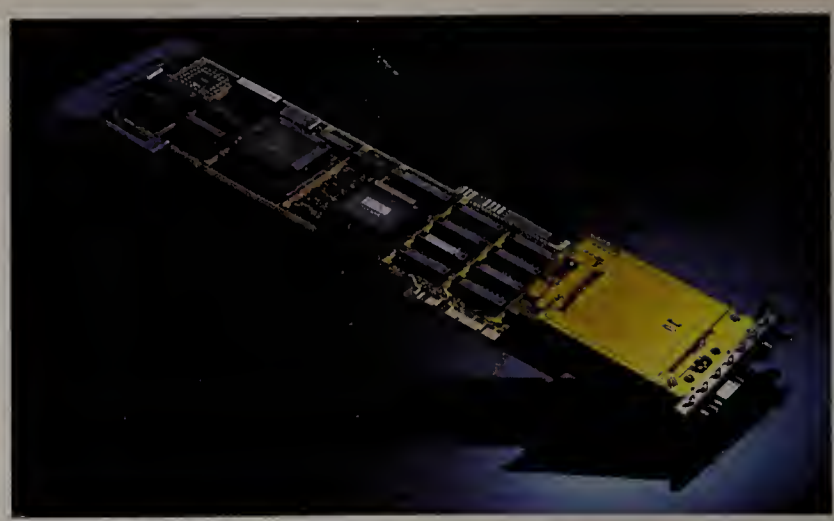
Handling those different system bus architectures isn't the only trick the IRMAtrac has up its sleeve—it can also communicate at different speeds over different Token-Ring LAN media.

The IRMAtrac uses replaceable Ring Interface Modules (RIMs) so that you can configure the board to run on either 4-mbps shielded or unshielded twisted-pair cable or 16-mbps shielded twisted-pair. You just add the appropriate RIM from among the two that ship with the board.

Since it's equipped with an on-board processor and 128K of RAM for MCA bus mastering, IRMAtrac can process communications in the background on an MCA compatible while the CPU is busy with other applications. The board supports industry standards for Token-Ring hardware and software including DCA's 10Net Plus LAN operating system, Microsoft LAN Manager, IBM PC LAN, Novell NetWare 286 and 386, and 3Com 3+ Open.

The board is software configurable, so no adjustment of DIP switches is needed. You select data transmission speed, interrupt levels, and so on via a menu-driven program. IRMAtrac sells for $895. Digital Communications Assoc., 1000 Alderman Dr., Alpharetta, GA 30202-4199; 404/442-4762. —*Mike Hogan*

Reader service no. 746



IRMAtrac Token-Ring Adapter/Convertible works on an ISA or MCA bus and can communicate at different speeds over different Token-Ring LAN media.

Desk Station, T24D/X

Toshiba Enhances Its Portables

Toshiba has added several enhancements and options to its portable line, ranging from docking stations to better battery packs and larger hard drives.

The Desk Station elevates four of Toshiba's notebooks—the T1000SE, T1000XE, T1200XE, and T3100SX—to the status of desktop machines. Plug your portable into the Desk Station, and you can instantly connect to printers, modems, serial devices, your network, an external keyboard, an external monitor, and an expansion bus. About 15 inches wide by 11 inches deep and only 3 inches high, the Desk Station for the T1000SE, T1000XE, and T1200XE sells for $1199 and comes with two full-length 16-bit slots or one full-length and one half-length slot, plus a proprietary slot for a Toshiba modem or Ethernet card—all 16-bit. You also get two serial ports, a parallel port, and a DC output port.

The Desk Station for the T3100SX is of a very different design—about 16 inches wide by 6 inches deep, but 9 inches high. For $1499, you get two full-length 16-bit slots and a full 8-bit slot, two serial ports, a parallel port, a DC output port, an RJ11 modem port, and a keyboard port.

Toshiba has also unveiled a cellular modem option that fits the above laptops as well as its T1200, T1600, and T3200SX. The T24D/X offers both a standard RJ-11 telephone connection and an optional intelligent cellular telephone interface for modem access via a cellular network. Spectrum Cellular's SPCL Protocol ensures error-free transmissions over the cellular system. The T24D/X provides V.22bis and Hayes compatibility at 2400 bps and MNP-5, V.42, and V.42bis error correction and data compression for 9600-bps transmissions.

Larger hard disks are now available for the T3100SX and T3200SX. A T3100SX with a 25ms 80MB drive retails for $6799, while the T3200SX with a 19ms 120MB drive sells for $6999. Both include a 16-MHz 386SX processor, 1MB of memory expandable to 13MB, and a VGA gas plasma display. Toshiba America Information Systems, Computer Systems Division, 9740 Irvine Blvd., Irvine, CA 92718; 800/334-3445. —*Mike Hogan*

Reader service no. 753

Toshiba's T24D/X cellular modem gives its laptops both a standard RJ-11 telephone connection and an optional intelligent cellular telephone interface for modem access via a cellular network.

If you're not using XTreePro Gold, here's how you're filing your documents.

If you're filing documents in the depths of your PC, finding them again can be a tedious search. But once you organize your hard disk with XTreePro Gold,™ you'll find every file, every time.

You see, XTreePro Gold is the most complete file manager you can buy. Now you can forget all those difficult DOS commands. Its unique global features let you see your entire hard disk–and all the files organized on it. For instance, Autoview lets you browse through your file directory and look at each file without leaving the program. Or use the Split Window to copy or compare groups of files across different drives or directories. You can tag, copy, and move files in a snap.

Forget a file name? Good news: XTreePro Gold locates files by content, too. You can even edit files within XTreePro Gold by using the Text Editor. Or open any file and its application with a key stroke or a click of the mouse. XTreePro Gold is that simple to use.

PC MAGAZINE EDITORS' CHOICE
June 12, 1990
XTree Pro Gold, Version 1.31

Call XTree for a detailed brochure at 1-800-634-5545. In California, call 1-800-551-5353. For information in Canada, call 1-416-866-8592. Other international, call 1-805-541-0604. And find out how easy it is to turn your straw into gold.

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Circle 340 on reader service card

QEMM 5.1, Desqview 2.3

Quarterdeck Takes Windows Challenge

Quarterdeck's latest Desqview brings the memory-grabbing capabilities of its QEMM memory manager to Windows applications.

Microsoft claims that *Windows 3.0*'s memory-handling capabilities have eliminated the need for 386 memory managers like Quarterdeck's *QEMM* and multitaskers such as Quarterdeck's *Desqview*. In fact, until now *Windows 3.0* wouldn't work with either product or with other memory managers. Quarterdeck rises to the challenge with *Windows*-compatible versions of *QEMM* and *Desqview*.

Windows lacks one major feature found in memory managers like *QEMM*: the ability to place device drivers and RAM-resident programs in the unused memory between 640K and 1MB. That inability means each driver and TSR loaded before *Windows* reduces the RAM available to every non-*Windows* application run inside *Windows*; if you're on a network, you can't expect to get more than 500K of RAM for any standard DOS application. Enter version 5.1 of *QEMM*, which supports all three of *Windows 3.0*'s memory-handling modes, letting you run large DOS applications inside *Windows 3.0*.

Similarly, if you're torn between buying *Windows* and *Desqview* because many programs that use DOS extender technology, such as *Paradox 386*, won't work in *Windows*, don't worry. *Desqview 2.3* will support *Windows 3.0* in real or standard modes so that you can run *Windows*, along with its own applications, inside a single *Desqview* window. *Desqview 2.3* won't support *Windows*' 386-specific enhanced mode, but the principal advantage of that mode is multitasking non-*Windows* applications, a capability you get through *Desqview*.

QEMM costs $99.95 and requires DOS 2.0 and a 386 with 1.8MB of RAM; upgrades are $40. *Desqview 2.3* sells for $129.95 and requires DOS 2.0 or later and 640K of RAM; upgrades are $35. The two programs are bundled as *Desqview 386* for $219.90, with upgrades to past versions available for $65. Quarterdeck Office Systems, 150 Pico Blvd., Santa Monica, CA 90405; 213/392-9851, 213/399-3802 (fax). —*Lincoln Spector*

Reader service no. 748

R:base 3.1

Tucking and Rolling Out a New Version

With its mouse-driven interface and query-by-example features, *R:base 3.0* was a ground-breaking upgrade for Microrim. But users howled about its hefty 520K memory requirement.

As a result, Microrim has tucked and squeezed *R:base* so that it runs in 480K of conventional memory. Not only does *R:base* version 3.1 offer significant performance enhancements and a more polished interface, but the lower memory requirement makes this relational data base accessible and convenient for many more users.

Microrim also has taken note of the real world by incorporating a "dBASE connector" that will let *R:base* applications read, query, write, and edit dBASE files in their native format alongside *R:base* tables. That means you can have a dBASE application and an *R:base* application side by side, put common information in a shared dBASE file, and never have to worry about data integrity problems or file import/export again. The upgrade is free to registered *3.0* owners and $195 to registered owners of previous versions. Microrim, 3925 159th Ave. NE, Redmond, WA 98052; 206/885-2000, 206/881-7723 (fax). —*Ed Bott*

Reader service no. 752

25 Plus/Charisma MasterCartridge

Laser Fonts With an Upgrade Path

When you start out in desktop publishing, you focus on the price of your laser printer. Then you're surprised at how much you spend for font cartridges—and how quickly those cartridges pile up, many with overlapping sets of fonts.

Elite Business Applications takes aim at both problems with its upgradable font cartridge, the 25 Plus/Charisma MasterCartridge. For $399, you get the MasterCartridge with 15 monospaced and proportional typeface families, including Helvetica, Times Roman, Courier, and Prestige Elite. You also get not-so-common "typefaces" such as bar codes, postal bar codes, and Zapf Dingbats. Some come in bold and italic, and most range from 6 to 30 points. For the small print that you don't want anyone to read, there are fonts as small as 3.6 points.

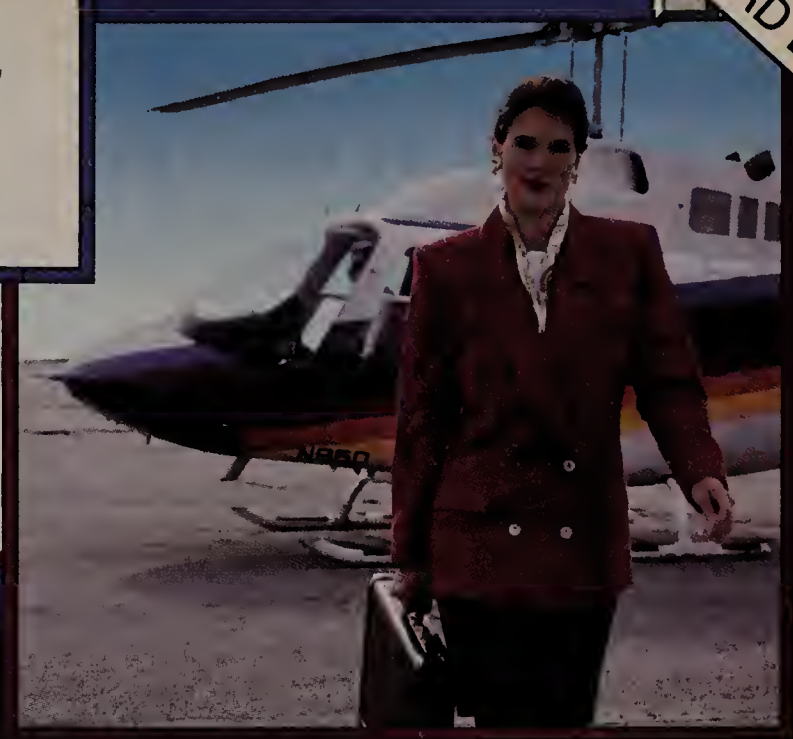
But the beauty of the MasterCartridge is that you can add modules simply by plugging them into one of four slots. The modules cost $99 each, but they include such avant-garde offerings as Avant Garde, Headlines, Century Schoolboy, Donn Casal, Garamond, Optime, Palatino, and Park Place. Want a custom module? For a cost of $99 to $149, Elite will make a cartridge incorporating your logo, forms, symbols, and frequently used designs.

Compatible with most leading software drivers, the 25 Plus/Charisma works on the HP LaserJet II, IID, IIP, and III as well as Brother, Wang, and Olivetti printers. Elite Business Applications, 28 Rte. 3 N, Millersville, MD 21108; 800/942-0018, 301/987-9093 (fax). —*Susan Lusty*

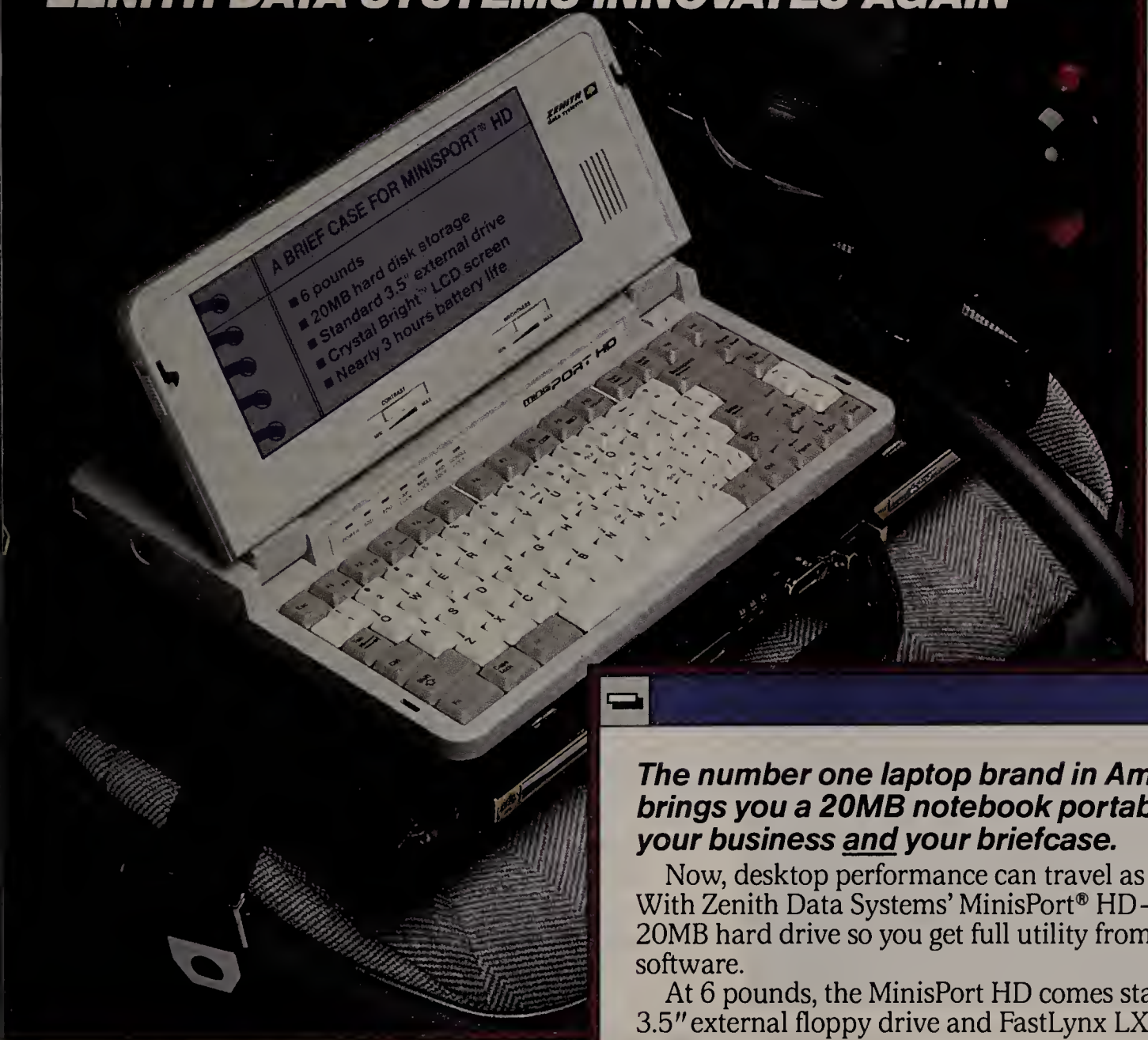
Reader service no. 747

NOW WITH 20MB HARD DRIVE

"Number crunching's for when I'm in the office. Out here, just give me a great little PC. And I mean little."



ZENITH DATA SYSTEMS INNOVATES AGAIN™



The number one laptop brand in America* now brings you a 20MB notebook portable that fits your business and your briefcase.

Now, desktop performance can travel as light as you do. With Zenith Data Systems' MinisPort® HD—featuring a fast 20MB hard drive so you get full utility from your favorite software.

At 6 pounds, the MinisPort HD comes standard with a 3.5" external floppy drive and FastLynx LX™ for easy data transfers to and from other PCs. A *Crystal Bright*™ backlit LCD screen that displays color applications in 8 shades of gray. And nearly 3 hours of battery life.

So put real desktop capacity in your briefcase. With the sleek MinisPort HD. For your nearest Zenith Data Systems Medallion Reseller, call: *1-800-523-9393.*

ZENITH
data systems

Groupe Bull

Graphics simulate Microsoft® *Windows™ version 3.0*, a product of Microsoft Corporation. MinisPort is a registered trademark and Crystal Bright is a trademark of Zenith Data Systems Corporation. *Source: 1990 Dataquest estimate for U.S. battery-powered laptops.

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Circle 290 on reader service card

Epson ES-300C

A Royal Scanner at a Humble Price

When you want to create a royal impression, sometimes even photo-quality black-and-white images aren't enough. Desktop publishers and presenters looking forward to a more colorful future need cast their gaze no farther than the familiar Epson name. The dot matrix printer king has introduced a gray-scale/color scanner that sells for less than $2500—a price even occasional publishers can afford.

Epson's ES-300C scans up to 256 levels of gray and 16.7 million colors at up to 300 dots per inch. The ES-300C can *output* at 600 dpi—a facility that products like Intel's *Visual Edge* image enhancer put to good use.

At $1995 for the scanner and $495 for an interface kit (an 8-bit board bundled with image-editing software), Epson's flatbed unit is slightly less expensive than Microtek's equivalent, the $2695 MSF-300Z. Epson sweetens the deal with an unusually wide selection of software for both *Windows* and DOS. You get *Windows*-based *Colorlab ES-300C* and DOS-based *Color Halo Scan,* both of which excel at image capture, plus the additional image-manipulation powers of *Image-In* and *Picture Publisher Plus.*

The 20-pound unit handles images up to 8½ by 11 inches and can output directly to Epson color dot matrix printers and the Hewlett-Packard PaintJet. The ES-300C's proprietary scan engine won't emulate other popular scanners like HP's ScanJet, but Epson plans to offer drivers for leading programs such as Z-Soft's *PC Paintbrush IV Plus.*

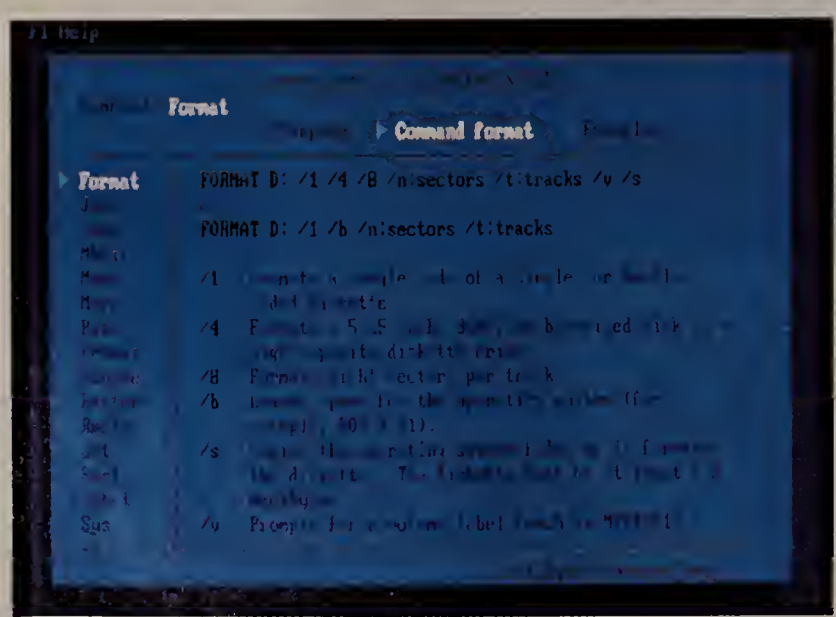
Epson's affordable ES-300C scans 256 levels of gray and 16.7 million colors at up to 300 dpi—and comes with a healthy amount of software.

Image-In and *Picture Publisher Plus* require at least 1MB of RAM and *Windows 2.0* or a later version. Epson America, Inc., 23530 Hawthorne Blvd., Torrance, CA 90505; 800/922-8911. —*Daniel Tynan*

Reader service no. 741

PFS:Preface

Dressing Up DOS With Menus, Help



PFS:Preface takes the mystery out of the C: prompt with a menu system and DOS shell combination that includes context-sensitive DOS help.

Software Publishing has stepped into the ongoing grudge match between users and DOS with still another menuing and file management system designed to let you remain happily ignorant of DOS. *PFS:Preface* differs little from the many existing menu system/DOS shell combinations except in speed.

At the most basic level, *PFS:Preface* helps you organize your software into menus without having to learn DOS syntax. You launch an application simply by typing the number that appears beside it. Beyond that, *PFS:Preface* streamlines common file and directory management tasks by letting you use a pulldown menu or an <Alt>-*key* combination to access help or execute common DOS functions. The program gives you context-sensitive help for *PFS:Preface* itself, and a window provides lucid explanations of common DOS commands. And *PFS:Preface* is network ready, so you can display remote menus and perform other operations on the disks that the menus serve.

When you get down to building menus, *PFS:Preface* saves you time by searching your hard disk for the more than 100 applications that it recognizes and automatically loading the ones it discovers into your main menu. You can opt to skip this step and specify programs yourself, and you can even organize them into submenus that cascade from main menu choices.

When an application is loaded, the *PFS:Preface* screen quickly swings aside like a theater curtain, and the program called for pops onto the screen. Although the file manager is not as powerful as *Norton Commander*'s, it does simplify routine work such as copying, deleting, renaming, and moving files as well as viewing ASCII files. The $69 *PFS:Preface* requires DOS 2.1 or later, 325K of RAM, and a hard disk. A mouse is optional. Software Publishing Corp., 1901 Landings Dr., Mountain View, CA 94039-7210; 415/962-8910. —*Steve Bass*

Reader service no. 742

This is what you pay for our tape backup.

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Even if you didn't know their price, chances are you'd still choose Everex tape backup systems.

They're so easy to use, most novices won't even need the manual. Yet they still offer everything the most sophisticated user could desire, from diagnostic software to automatic schedulers.

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Circle 69 on reader service card

Charisma

Word Charts, Slide Shows for Windows

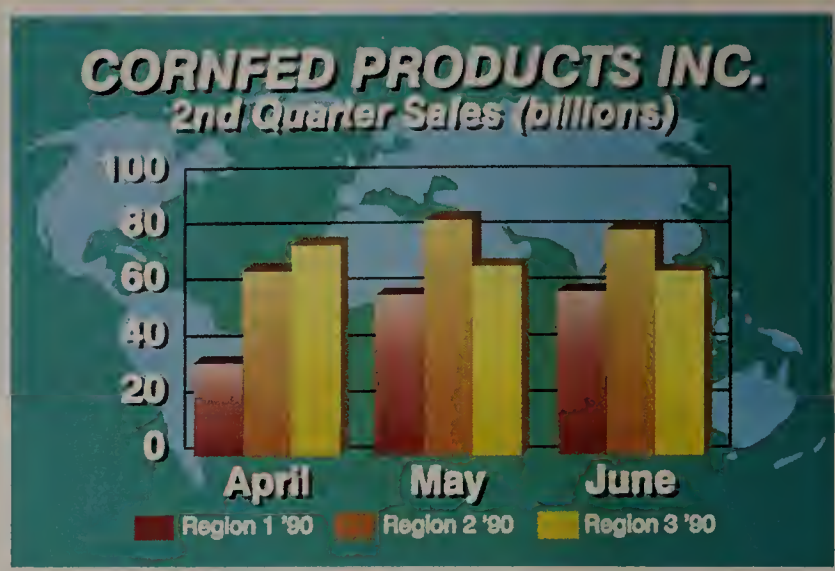
What better application for *Windows 3.0*'s graphical interface and memory management than business graphics?

Micrografx's *Charisma* hopes to use the *Windows 3.0* platform as a springboard to overtake *Harvard Graphics 2.3*, neatly integrating its word charts, business charts, desktop presentations, and draw capability. Like *Harvard*, *Charisma* uses templates to speed the creation of word charts and illustrations as well as business charts that include area, bar, column, line, pie, scatter, table, and combination charts in 2-D and 3-D variations. It also includes more than 2200 free clip-art images. You can store your customized charts for future use.

Charisma's illustration capability includes the usual drawing tools, but you also get Bézier curves and the ability to do gradient fills in more than 16 million colors.

Increasingly, though, the focus in graphics packages is on desktop presentations. *Charisma* includes SlideShow, an electronic utility that provides more than 30 transitional effects between screen shots, 20 predefined word chart templates, and 80 predefined business charts. You can have as many as 30 slides per file and an unlimited number of files in a single presentation, and you can choose either manual or automatic operation. What *Charisma* lacks is the ten-slide branching capability of *Harvard*.

You can use images created not only with *Charisma* but with Micrografx's *Designer* and *Draw Plus* as well as color or black-and-white PCX, EPS, and TIFF files. And *Charisma* also ships with an enhanced DDE Link Macro to bring in charts and data from *Excel* or to transfer copy among its own modules.



Charisma helps you create good-looking charts and SlideShow desktop presentations fast under the Windows interface.

Charisma, which retails for $495, requires *Windows 3.0* and corresponding hardware. Owners of Micrografx's *Graph Plus* can upgrade for $100. Micrografx, 1303 E. Arapaho Rd., Richardson, TX 75081; 800/733-3729, 214/234-2410 (fax). —*Mike Hogan*

Reader service no. 750

The Brick

Ergo's Modular Mail-Order PC

The Brick, Ergo Computing's 386SX-based portable, fits in half a briefcase, but it's designed primarily for the trip between office and home.

The core module has an 8-by-11-inch footprint, stands 3 inches tall, and weighs 8 pounds. It includes a 16-MHz 386SX, 1MB of RAM (expandable to 8MB), a 3½-inch floppy, a 22ms 40MB hard drive, and an extended VGA adapter with 1MB of video memory, supporting 1024 by 768 pixels and 16 colors. For the $2695 price, you get a keyboard, a desktop-style monochrome VGA monitor, a 2½-pound power supply, a half-card 8/16-bit slot, one parallel and two serial ports, and a 2400-bps modem. Add $80 for DOS 3.3.

Due by year-end is a paper-white VGA LCD screen for $895 that will use an expansion slot but will fit in a briefcase with The Brick. A 180-pin connector will let The Brick fit atop an optional docking station planned for late 1990. Optional hard drives include 25ms 100MB and 18ms 200MB models for $395 and $995 respectively.

Ergo also sells upscale models, starting with a $4495 machine with 4MB of RAM, a mouse, a 100MB drive, and a 120MB tape backup. These models come with preconfigured software that includes DOS, *Desqview 386, Quattro, askSam, Tree86,* disk caching and encryption packages, and on-line DOS and system manuals. Ergo Computing Inc., One Intercontinental Way, Peabody, MA 01960; 800/843-2743, 508/535-7512 (fax). —*Eric Bender*

Reader service no. 743

DesignView 2.0

New-Breed Design Tool for Windows

When *DesignView* appeared, its immaturity was typical of a first release, but it clearly had the potential to fundamentally change the way engineers work. Release 2.0's features reflect a lot of maturing—a virtual reversal of 1.0's shortcomings. That it runs under *Windows 3.0* is icing on the cake.

DesignView was one of the first PC programs to implement dimension-driven variational geometry. The second release takes another leap by adding support for quadratic and cubic splines, rotatable grids, delayed recalculation, mass property synthesis, import of IGES and DXF files, and enhanced mathematics capabilities with inequalities, absolute values, logic functions, a warning function, and integer conversion. Users can also define their own formulas, which appear as native functions. Mass property synthesis is useful for optimizing geometry based on volume, stress, weight, and cost constraints. For example, *DesignView* could scale a complex 2-D profile of a fluid container to meet a volume constraint.

DesignView retails for $895. Registered users can upgrade by buying the $295 annual support policy. Requirements are the same as for *Microsoft Windows*. The *Simulation Module* and an *Applications Library* are available separately for $295 each. Premise, Inc., 3 Cambridge Ctr., Cambridge, MA 02142; 800/888-7736, 617/225-0322. —*Chris DeLucchi*

Reader service no. 754

They Left out Features....
We Left out the COMMA!!

The only thing missing...

is the comma in the price. If you look at the chart on the right you will see prices charged by our competition. All but one contain a comma. DesignCAD 3D sells for $399.00. Period. No Comma!

In order to draw the complex pictures shown below it is desirable to have the following 3D features:

- **Interactive design with 3D cursor**
- **Blending of surfaces**
- **Boolean operations such as add, subtract, and intersection**
- **Complex extrusions**
- **Cross sectioning**
- **Block scaling**
- **On screen shading**
- **Shaded output to printers and plotters**

All of these competitors left out one or more of these desirable features in their standard package. They didn't forget the most horrible feature - the comma.

DesignCAD 3D offers **ALL** the listed features plus many more!

If DesignCAD 3D has the power to create the 3D objects shown below, imagine how it could help with your design project!

DesignCAD 3D sells for $399. We left out the comma. We didn't think you would mind!

PC MAGAZINE SAYS...

DesignCAD 3D, the latest feature-packed, low-cost CADD package from American Small Business Computers, delivers more bang per buck than any of its low-cost competitors and threatens programs costing ten times as much. For a low-cost, self-contained 3D package... DesignCAD's range of features steals the show."

$399

AutoCAD rel. 10	$3,000.00	AutoCAD AEC $1,000.00 AutoShade $500.00
CADKEY 3.12	$ 3,195.00	Solids $995.00 IGES translator $1,995.00
DataCAD with DC Modeler	$ 3,990.00	DataCAD Velocity $2,000.00
DesignCAD 3D ver. 2.0	**$ 399.00**	**NO expensive options! IGES Free, Shading Free**
MaxxiCAD 1.02	$ 1,895.00	N/A
Mega Model	$ 995.00	MegaDraw $195, List $295, MegaShade $395
MicroStation PC 3.0	$ 3,300.00	Customer Support Libraries $1,000.00
ModelMate Plus 2.8	$ 1,495.00	N/A
VersaCAD Design 5.4	$ 2,995.00	N/A

Source: Byte Magazine

BYTE MAGAZINE SAYS...

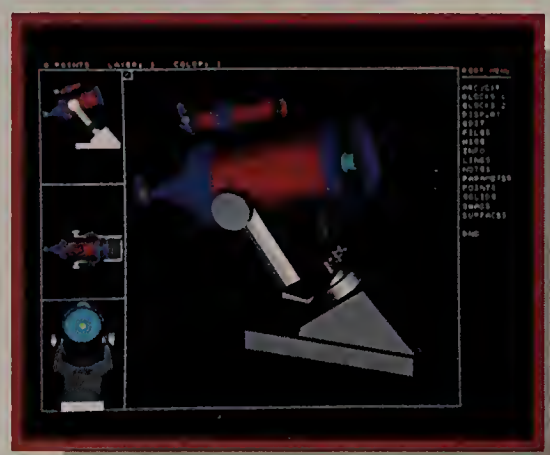
"At $399, DesignCAD 3D was the least expensive package we saw, yet it was one of the more powerful. ..Don't be fooled by the remarkably low price, this program can really perform!"

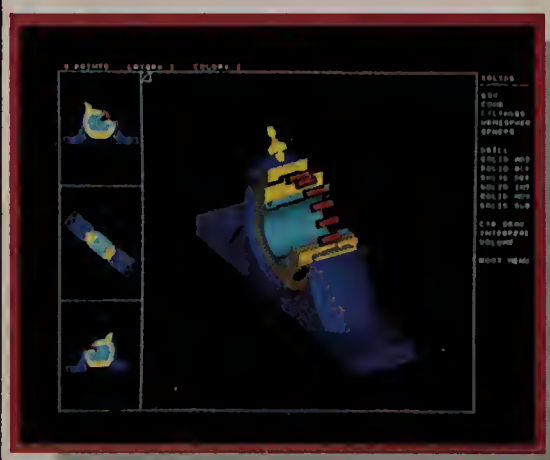
Complete 3-Dimensional design features make it easy for you to construct realistic 3-D models. With full solid-object modeling capabilities you can analyze your drawing to determine the volume, surface area or even center of gravity! DesignCAD 3-D even permits you to check for interference between objects! Aeronautical Engineers can now find the center of gravity for a new airplane design with a couple of keystrokes. The Architect can determine the surface area of a roof for decking in a matter of minutes. The Civil Engineer can calculate the volume of a lake or dam in seconds. The Mechanical Engineer will know for sure if certain parts fit together without interference. The uses for DesignCAD 3-D are only limited by YOUR imagination!

HOW DO I GET ONE?

DesignCAD 3-D and DesignCAD 2D are available from most retail computer stores, or you may order directly from us. If you have questions about which program to purchase please give us a call. All you need to run DesignCAD 3-D is an IBM PC or compatible computer with 640 K RAM memory and a hard disk. Both products support most graphics cards, printers, plotters and digitizers. Free Information and a demo disk are available by faxing (918) 825-6359 or telephoning:

1-(918) 825-4844





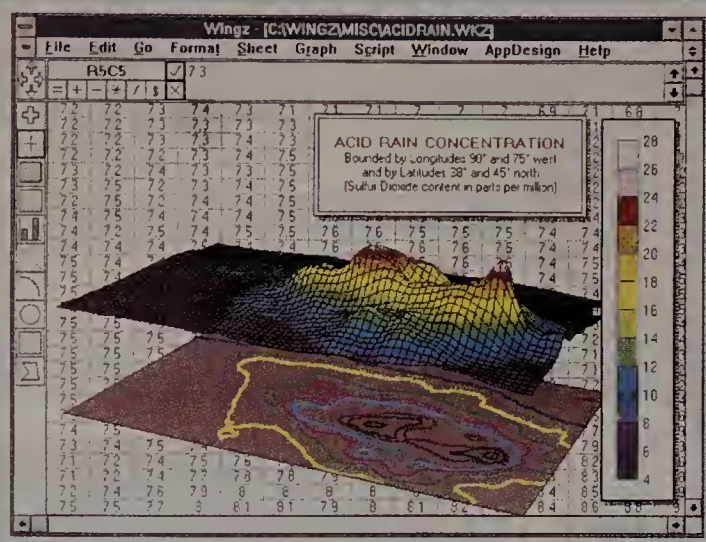
American Small Business Computers • 327 South Mill Street • Pryor, OK 74361 U.S.A.

Circle 306 on reader service card

UPDATE

New Versions of Your Favorite Products

Wingz PC Bonus Pack



Informix packs Windows 3.0 and OS/2 Presentation Manager versions of the Wingz graphic spreadsheet together in the same box.

The *Windows 3.0* and the OS/2 Presentation Manager versions of the *Wingz* graphical spreadsheet are available in a single package for $499. Both support Dynamic Data Exchange, enabling data to be shared with other applications supporting these environments. Informix Software, Inc., 4100 Bohannon Dr., Menlo Park, CA 94025; 800/438-7627, 415/926-6593 (fax).

Reader service no. 761

SpinRite II 1.1

Version 1.1 of SpinRite II, the disk diagnostic and maintenance tool, can perform its testing, interleave adjustment, and low-level reformatting tricks on a wider variety of hard disks. Those include disks with track-buffering and sector-translating controllers such as ESDI, SCSI, and IDE subsystems as well as Plus Development Hardcards and laptop drives. Version 1.1 also ships with a utility to automatically park a drive's heads on an unused area when it's not in use. Upgrades to the $89 product are free to registered users. Gibson Research Corp., 22991 La Cadena, Laguna Hills, CA 92653; 800/736-0637, 714/830-0300.

Reader service no. 755

Read-It O.C.R. 2.0

Version 2.0 of *Read-It O.C.R.*, Olduvai's popular optical character recognition program, takes full advantage of the graphical user interface and memory management features of *Windows 3.0*, letting you utilize extended, expanded, and disk memory for optical character recognition. It includes new drivers, new fonts, and the ability to save text in *WordPerfect*, *WordStar*, and ASCII format. Upgrades for the $495 product are $49. Olduvai Corp., 7520 Red Rd., Ste. A, South Miami, FL 33143; 800/822-0772, 305/665-0671 (fax).

Reader service no. 756

The Norton Backup 1.1

Version 1.1 of *The Norton Backup* operates faster and supports a larger number of operating environments, BIOS combinations, and disk types. The backup-to-floppy program now compresses data into less space. Upgrades to the $149 *Norton Backup* are free to registered users of *1.0*. Peter Norton Computing, 100 Wilshire Blvd., 9th floor, Santa Monica, CA 90401-1104; 800/626-8847 California, 800/441-7234 (U.S.).

Reader service no. 757

Professional Write 2.2

Software Publishing has integrated the grammar checker *Grammatik IV* into *Professional Write 2.2*, its executive word processor. The package also adds support for more printers and font cartridges, longer documents, and auto-hyphenation. The cost of upgrades to this $249 word processor vary, depending on your previous version and when you bought it. Software Publishing Corp., 1901 Landings Dr., Mountain View, CA 94039-7210; 415/962-8910.

Reader service no. 758

Project Bridge

Applied Business Technology offers a project-estimating tool for use with its high-end project management software, *Project Workbench*. Targeted at MIS software engineers, *Project Bridge* lets users integrate top-down and bottom-up estimating with the other decision criteria. *Project Bridge* is a $5000 add-on to the $1275 *Project Workbench*. Applied Business Technology Corp., 361 Broadway, New York, NY 10013; 212/219-8945.

Reader service no. 759

Microsoft Mouse/Windows 3.0

The 400 Series Microsoft Mouse is now available in a bundle with *Windows 3.0* for $225, a $49 saving over the $274 price of both products when sold separately. The Mouse is available in both bus and serial versions. Microsoft Corp., One Microsoft Way, Redmond, WA 98052-6399; 206/882-8080.

Reader service no. 760

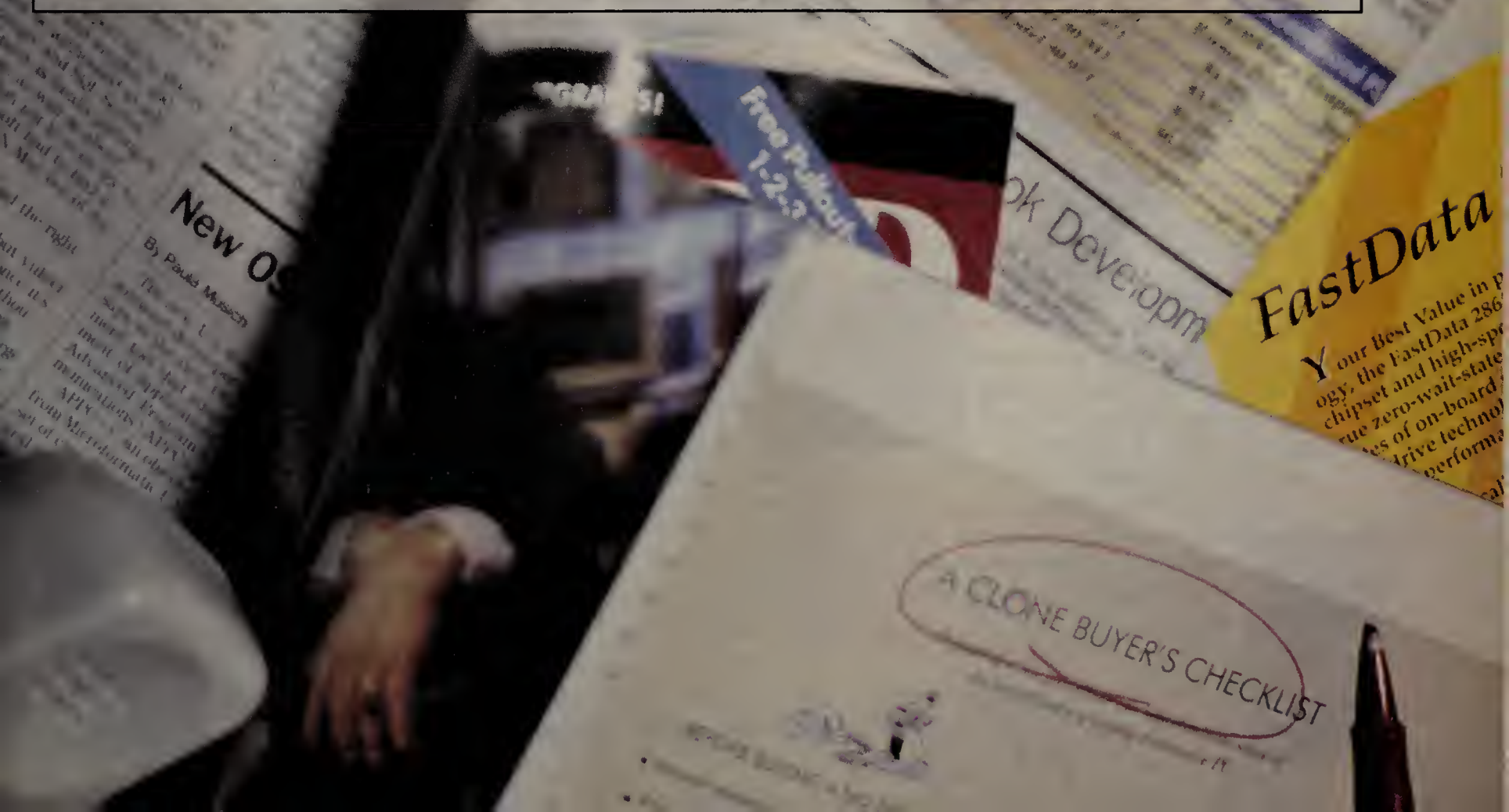
WordPerfect Office Editor 3.0

The program and macro editors in *WordPerfect Office 3.0* are now available as a separate product called *WordPerfect Office Editor 3.0*. The $45 package includes enhanced functions such as definable tables, editing in Reveal Codes, multiple-document editing, and support for the macros of *WordPerfect 5.0, 5.1, PlanPerfect 5.0*, and *Shell 3.0*. WordPerfect Corp., 1555 N. Technology Way, Orem, UT 84057; 800/321-4566.

Reader service no. 763

For more information about any product, contact the manufacturer or circle the number on the reader service card.

When choosing a personal computer, there are two questions you should ask.



Why FastData?

A personal computer is a large investment; before you choose, we want you to know what to expect when you purchase a FastData personal computer from FastMicro.

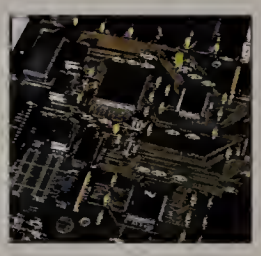
Superior Design.

You get more out of your FastData personal computer because we put more into it. We've been building PC's longer than most of the competition and we put that experience to work for you. We use proven designs that pass our stringent performance requirements and compatibility standards so it will be sure to pass yours.

Full Support.

Our team is standing by and ready to make your FastData computer perform to its greatest potential for you. When you buy a FastData computer, you're covered by Toll-Free technical support for life. And since we sell more software than other computer companies, we are uniquely qualified to give the proper support the customer deserves.

Better Components.



The whole is only as good as the sum of its parts; and FastData systems use some of the best parts in the industry. For example, each FastData system ships with a Keytronics keyboard; Keytronics costs a lot more than others, but the quality is worth it.

Our systems use exclusively Toshiba floppy drives, the industry leader. Standard equipment includes other quality components from Western Digital, Phoenix, Chips & Technologies, just to name a few.

Service.

All FastData personal computers come with a full one year warranty, but that's just the start. In the unlikely event your computer is down, it is our goal to get back up and working as quickly as possible - and we back it up with action. Call us toll-free and we'll work with you to determine the problem; if a part breaks, we will send you the replacement part through our FastSHIP program - before the broken part is returned to us - and we'll pay the freight both ways. If our phone support or FastSHIP program can't solve your problem, we will service it on-site to most U.S. locations or replace your computer at no charge. Now that's service.

Selection.

Our face to face retail background has made us never forget that the customer comes first and that a personal computer is just part of a customer's overall needs. That's why FastMicro offers thousands of hardware and software products to enhance your new personal computer. In fact, our competition will probably tell you to call us when you need something to run on their personal computer.

Risk Free.

We pass the test for the choosiest of customers; in fact, FastMicro sells to over half of the Fortune 500 and Universities in 47 states (we're working on the rest). These people buy for a living and rely on us, you can too. You can do more than take our word on it - go ahead and purchase any FastData brand product from FastMicro and if you are not thoroughly satisfied after 30 days, you can return it for a full refund of the purchase price.

Circle 100 on reader service card

Which FastData?

$1599 FastData 386/SX

Combine the benefits of an advanced Intel 386 processor, the value of a 286 and the advantages of FastData and you've got the FastData 386/SX! This machine is the choice of those who want to run today's powerful 386 and multitasking software, like Windows, and want to rip through their favorite programs, like Lotus and WordPerfect at blinding speeds. This machine is ideal to run the latest memory demanding and graphic software, right out of the box. We've made our customers' favorite options standard: it comes with an ample two megabytes of memory, a high performance 40mb hard drive, and 16 bit color VGA. Compare performance, features, and service and you will find no better SX value. Interested further? Try the FastData 386/SX for 30 days; you have to be happy - if not, we'll take it back.

Standard Features

- ✓ 16mhz Intel 80386-SX processor. (20mhz optional)
- ✓ 2 megabytes of zero wait-state RAM.
- ✓ 40 mb 28ms IDE hard disk, 1:1 interleave.
- ✓ 1.2mb 5.25" or 1.44mb 3.5" floppy drive. (Second drive add $79)
- ✓ Standard chassis with keylock, speed and reset buttons. (Optional chassis add $50)
- ✓ Five available drive bays.
- ✓ 200 watt power supply
- ✓ 14" VGA color monitor with 16 bit VGA card with 256K.
- ✓ Clock calendar, parallel port, and two serial ports. (Game port included on color systems)
- ✓ Keytronics 101 key keyboard.
- ✓ 8 expansion slots, 5 available.
- ✓ 80387-SX coprocessor socket.
- ✓ Full Shadow RAM and LIM 4.0 EMS support.
- ✓ Phoenix BIOS.
- ✓ Compatible with DOS, OS/2, Windows, Xenix and Novell.
- ✓ FCC Class B approved.

System Price	40mb	65mb	80mb	100mb
Monochrome	$1,269	$1,369	$1,519	$1,619
VGA Color	$1,599	$1,699	$1,849	$1,949
VGA 1024	$1,749	$1,849	$1,999	$2,099

FastData 386/25 $2299

The optimum combination of features, expandability, and power make the FastData 386/25 an ideal choice for those whose applications demand the most from a computer. Whether running as a network fileserver, CAD or graphics station, or power-user's workhorse, the FastData 386/25 handily meets the challenge. It comes configured with a whopping four megabytes of fast RAM, a superfast 22 millisecond 65 megabyte hard disk, and maximum VGA displaying 1024 by 768 resolution powered by a high-output 16 bit 512K VGA board. Plus, the FastMicro team will configure your FastData 386 exactly the way you want, without sending you shopping elsewhere. When evaluating 386-DX workstations, why even consider anything else?

Standard Features

- ✓ 25mhz Intel 80386-DX processor. (33mhz optional)
- ✓ 4 megabytes of zero wait-state RAM.
- ✓ 65 mb 22ms RLL hard disk, 1:1 interleave.
- ✓ 1.2mb 5.25" or 1.44mb 3.5" floppy drive. (Second drive add $79)
- ✓ Standard chassis with keylock, speed and reset buttons.
- ✓ Five available drive bays.
- ✓ 80387-DX coprocessor socket.
- ✓ 200 watt power supply
- ✓ 14" Super VGA color monitor, 1024x768 resolution, with 16 bit VGA card with 512K.
- ✓ Clock calendar, parallel port, and two serial ports. (Game port included on color systems)
- ✓ Keytronics 101 key keyboard.
- ✓ 8 expansion slots, 5 available.
- ✓ Full Shadow RAM and LIM 4.0 EMS support.
- ✓ Phoenix BIOS.
- ✓ Compatible with DOS, OS/2, Windows, Xenix and Novell.
- ✓ FCC Class B approved.

System Price	65mb	80mb	100mb	200mb
Monochrome	$1,819	$1,969	$2,069	$2,469
VGA Color	$2,149	$2,299	$2,399	$2,799
VGA 1024	$2,299	$2,449	$2,549	$2,949

FASTMICRO

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FAST MICRO 1-800-441-FAST

Hardware

PRINTERS

ALPS Allegro 500 309
Citizen
200GX 189
GSX140 285

Citizen GSX140 $285

Loaded with features, this 24 pin printer is a hot seller! It comes with 6 resident fonts, paper parking, and Epson & IBM printing modes. It does up to 192 CPS and has a unique LCD control panel that lets you set everything without DIP switches. Upgrade to color anytime for just $39.

Diconix 150 Plus 329
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Okidata
182 Turbo 225
320 (IBM) 335
390 (IBM) 469
393 (IBM) 999
Panasonic
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KXP1124 299
KXP1624 429
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NX2410 279
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Texas Instruments Microlaser PS 1839

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NEC
Multisync 2a 469
Multisync GS 2a 205
Multisync 3d 629
Multisync 4d 1095
Panasonic
C1381 VGA 1024x768 new! 439

Panasonic Super VGA $439

The Panasonic C1381 will do VGA up to 1024x768 interlaced resolution. It has a dot pitch of .28 and is compatible with all standard VGA cards. Includes swivel base and VGA cable.

Princeton
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Ultrasync 12" 479
Ultrasync 14" (now 1024x768) 509
Ultra 16 835
Samsung ..... Call
Seiko
CM1440 519
CM1450 659
Sony 1304 Multiscan 669
Zenith 1492 ..... Call

BOARDS

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RAM8000 16 bit RAM card 169
Hercules Graphic Card + ... 169
Intel
8087-2 115
287XL *New!* 209
387-DX20 369
387-SX16 319
Logitech ScanMan Plus 165

ScanMan Plus by Logitech $165

The perfect companion to popular desktop publishing software, the ScanMan Plus comes with PaintShow Plus editing software. It scans from 100 to 400 DPI and up to four inches wide. Add just $139, and CatchWord OCR software will let your ScanMan actually read text!

Orchid
ProDesigner 229
ProDesigner II 512/1mb 299/349
Tiny Turbo 286 207
Tiny Turbo Xtra 267
Paradise
Basic VGA - 8 bit 109
VGA 1024 256K 175
VGA 1024 512K 229

Paradise VGA 1024 $175

The 16-bit VGA 1024 comes standard with 256K and is expandable to 512K & will do up to 256 colors. It does up to 1024x768 interlaced, is compatible with EGA & CGA software, & comes with drivers for most major software. Free Indiana Jones 256 color game included (while supplies last).

Practical Peripherals
1200B Int Modem 59
2400B Int Modem 125
2400B Int with MNP 169
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Promodem 1200B Internal 48
Promodem 2400B Internal. 98
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Lancard/E AT (16 bit Ethernet) 249
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V-RAM VGA 512K 355
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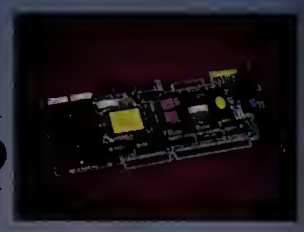
WD1006V-SR2 RRL AT 1:1 129
WE1007V-SE2 ESDI AT 1:1 199

FastData Products

FastData 16 Bit VGA



The FastData 16 bit VGA card features 256K of video memory, does CGA, EGA, & VGA up to 1024x768. Its expandable to 512K and comes with a 30 day money-back guarantee.

$99 256K Vers.
$129 512K Vers.

FastData CGA Card 35
FastData MGP Card 35

FastData 2400 Baud Internal Modem

$69 The FastData 2400 baud internal modem is fully Hayes compatible and can be configured to COM port 1-4. It has an internal speaker, is auto answer & auto dial, and comes with BitCom software.

Parallel/Dual Serial/Game Card 35
XT 1.44 Dual Floppy Controller 35

FastData Monitors

Your best value, we have a completeline made for us by leading manufacturers like Samsung & Hyundai. Like all FastData products, you have a full 30 day money back guarantee. Shown is the VGA Color for $319.

FastData Monitors
12" Amber Monochrome 79
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14" White VGA Monochrome 129
14" CGA Color .52 dot pitch 199
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14" Super VGA 1024 x 768i .28 dp. 399

DISK DRIVES

Colorado 40-120mb Int. Tape 249
Conner ..... Call
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60MB AT RLL MR535 269

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RLL encoding, 1:1 controller, and 22ms access time make this a very fast performer. The perfect upgrade for your 286 or 386 compatible, this kit comes with everything you need including controller and cables.

Seagate
20MB XT Kit #225 239
30MB XT Kit #238 249
40MB AT #251-1 299
Toshiba
360K Floppy 69
720K 3.5" Floppy 69
1.2MB 5.25" Floppy 79
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Complete with mounting brackets and installation instructions, this Toshiba works in all true 286 & 386 compatibles. Will also read/write/format 720K 3.5" disks. Rails, add $5.

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200DL UPS - XT Size 147
450AT UPS - 386 Size 317
Curtis
Command Center 85
Ruby Plus 59
Datashield
CPS-60 - 6 oulet surge 19
S-85 - 6 oulet surge EMI/RFI protection 49
S-100 - adds modem protection 57

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- ✓ 12mhz 80286 processor.
- ✓ 1 megabyte RAM.
- ✓ 40 mb 28ms hard disk 1:1 interleave.
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- ✓ Full documentation.
- ✓ FCC Class B approved.

System Price	40mb	65mb	80mb	100mb
Monochrome	$899	$999	$1,149	$1,249
VGA Color	$1,229	$1,329	$1,479	$1,579
VGA 1024	$1,379	$1,479	$1,629	$1,729

AST MICRO

Software

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Clarion Professional Developer	Call
Clipper 5.0	459
DataEase	459
dBase III+	419

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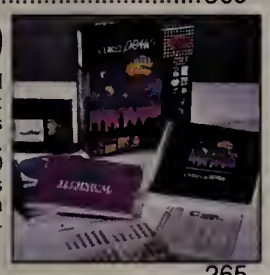
dBXL Diamond	129
Foxbase Plus	177
FoxPro	417
Paradox	419
Q & A	214
RapidFile	99
Rbase for DOS	447
Reflex	159

DESKTOP PUBLISHING & GRAPHICS

Autosketch	83
Corel Draw	309

Corel Draw $309



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Freelance Plus	307
GEM Desktop Pub.	159
Generic Cadd Level 2 Starter Kit	109
Generic Cadd Level 3	199
Harvard Graphics	275
Pagemaker	479
PC Paintbrush IV Plus	109
Perspective Jr.	69
PFS:First Publisher	89
Publisher's Paintbrush	149

Publish It! $104

The top-rated, entry-level desktop publishing software runs well even on an XT. Includes the GEM/3 user interface with easy pull down menus and multiple size page views. Supports most popular printers and has a variety of built-in fonts and sizes.

Publish It!	104
Ventura Publisher Gold	519

FINANCIAL

Bedford Integrated Acct.	145
DAC Accounting 4.0	79
DAC Bonus Pack 4.0	157
Dollars & Sense	Call
Managing Your Money	113

Peachtree Complete III $139

A super value! Includes General Ledger, Accts. Payable, Accts. Receivable/Invoicing, Purchase Order, Payroll, Inventory, Job Cost, Fixed Assets and more. Loaded with over 450 reports, automatic backup and helpful manuals.

Peachtree Complete III	139
Peachtree with Data Query	209
Quicken	35

INTEGRATED

First Choice	105
SmartWare II	Call
Windows 3.0	89
Works	89

MICE

Keytronics Professional	59
Logitech HiRes C9 Serial	65

Logitech C9 Serial Mouse

$65 Our best-selling mouse is top rated also. Comes with software to adjust the resolution just the way you want it and includes driver software and Pop-Up-Dos to make your computer hum at your fingertips. For PaintShow, add $15.

Logitech HiRes C9 Bus	76
Logitech Trackman Serial	75
Microsoft Serial or Bus w/ paint	95
Microsoft with Windows 3.0	147
PC Mouse II Serial or Bus	79

PROGRAMMING

Macro Assembler	89
Turbo C++	Call
Turbo Pascal	90
Quick Basic	60
Quick C	60
Quick Pascal	60

SPREADSHEETS

Allways	106
Excel	Call
Lotus 1-2-3 version 2.2	325
Lotus 1-2-3 version 3.0	Call
Lucid 3-D	53
Quattro Pro (call for details)	89

Lotus 1-2-3 Version 2.2 $325

The standard for spreadsheets, Lotus 1-2-3 version 2.2 is faster and more powerful than previous versions that made it famous. Includes add-in manager and more functions for greater flexibility. Also comes with Allways for great presentations made easy.

WORD PROCESSORS

GEM First Word Plus	52
Grammatik IV	49
Multimate 4.0	267
Professional Write	149
Rightwriter	45
Sprint	117
Word	209
Word for Windows	309

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What can we say? WordPerfect is the #1 rated word processor and the top selling software in the U.S.A. Its got almost every feature imaginable and yet it is easy to use. The current version adds pull-down menus, mouse support, table creation and equation editor. Add this to the best software support in the business and you can't go wrong!

Word Perfect 5.1	239
Word Perfect Add'l Station	153
Word Perfect Library	67
WordStar Professional	Call

WINDOWS SOFTWARE

Adobe Illustrator (GR)	279
Adobe Type Manager (UT)	59
Ami (WP)	115
Ami Professional (WP)	287
Asymetrix Toolbook	279
Corel Draw (GR)	309
DBfast/Windows (DB)	239
Excel (SS)	299
Form Publisher (DP)	139
Grammatik IV for Windows (WP)	49
PC Paintbrush for Windows (GR)	77
Pagemaker (DP)	479

Windows 3.0 $89

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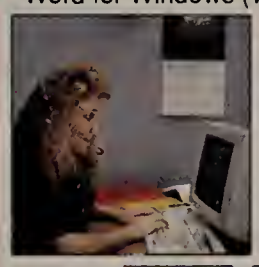
Publisher's Powerpak for Windows (DP)	45
Micrographix	Call
Microsoft Mouse w/ Windows 3.0	147
Windows 3.0	89
WingZ for the PC (SS)	309
Word for Windows (WP)	309



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Desqview 386	115

DESQview 386

$115 Bring multitaking to your 386. Includes DESQview, the award-winning multitasking environment. Also includes QEMM386, the memory manager for 386 machines that makes DESQview scream and can remap your TSR programs and transform your extended memory into expanded (EMS 4.0) memory. Includes Manifest Memory Analyzer as an added

Direct Access	54
Fastback Plus	109
FormTool Gold	52

FormTool Gold $52

The fastest, easiest way to create any form on your PC! Includes forms management, WYSIWYG preview, and intellegent line drawing. Has fill-in and merge capabilities and supports hundreds of printers. Includes over 100 pre-designed forms you can use or customize.

Formfiller	85
Headroom	59
Laplink III	85
MS-Dos 3.3	59
MS-Dos 4.01	59

Mace Utilities 1990	85
Norton Advanced	Call
PC Anywhere III	59
PC Tools Deluxe 6.0	79

PC Tools Deluxe $79

Get the collection of utilities that's won every award we've ever heard of! Includes Dos shell, desktop manager, disk cache, and data communications. Also includes hard drive utilities such as DiskFix, undelete, unfomat, backup and recovery. It also has Fax support, a special version of LapLink, and even more!

ProComm Plus	52
Prodigy	25
QEMM 386	52
QRAM	43

$52 ProComm Plus

Brings unequalled power to your modem! Includes 16 popular terminal emulations, 12 error-correction file transfer protocols, and a powerful script language. And it's easy to use and comes with an easy to understand manual and context sensitive help.

SideKick Plus	119
Sideways	37
Super PC Kwik	43
XTree Pro Gold	75

LAPTOPS WITH THE LIGHT STUFF

The days of the desktop PC may be numbered. These lean, mean systems have roomy hard disks and plenty of CPU power—but they're still small and light enough to fit in a briefcase

Michael Goodwin

Notebook computers are the machines for which many of us have put off buying laptops.

What *is* a notebook? *PC World* started out looking for hard disk laptops you could stuff into your briefcase and transport all the way to New Orleans without crushing your sandwich. In the end, because we know users don't want to trade features for portability, we sharpened our focus to lightweight laptops with hard disks, modems, full QWERTY keyboards, and either a built-in floppy drive or—my preference—an outboard floppy (see the sidebar "Floppies—Love 'Em and Leave 'Em").

What does "lightweight" mean? We drew the line at 10 pounds traveling weight (including PC, battery, modem, *and* AC recharger/power supply).

Seven laptops met our tough criteria—three 8086-based machines, and four that use an 80286 CPU. Two brand-new 286-based machines took Best Buy honors: Sharp's PC-6220 and Texas Instruments' TravelMate 2000. These incredible PCs combine mind-boggling portability with unheard-of battery life.

Texas Instruments' Travel-Mate 2000 (far left) and Sharp's PC-6220 (left) share great portability, long battery life, and a VGA display.

ROBERT CARDIN

Buying Light Is Buying Right

Whether you buy an 8086- or an 80286-based notebook, the key buying issues are portability, battery life, screen, keyboard, and price. If you plan to do more than word processing, telecommunications, or light spreadsheet work, then CPU type, RAM capacity, performance, and service and support will affect your buying decision too (see the sidebar "Buying Smart").

To help you make cost comparisons more easily, all the notebooks in this roundup have been priced in a standard *PC World* configuration: 1MB of RAM, a 20MB hard drive, either a built-in or an outboard floppy, a 2400-bps modem, and DOS.

8086 NOTEBOOKS

Compaq LTE

Until Compaq released this middleweight notebook and its faster brother (the LTE/286) last year, the laptop

Toshiba's T1200XE (left) and T1000XE (right) combine great portability, excellent screens and keyboards, and extremely low prices. Battery life is less impressive.

story was a tale of two trade-offs: If you wanted low weight you could forget about a hard disk and long battery life. These miraculous machines changed all that.

The LTE still delivers outstanding battery life and the fastest performance of any notebook in its class, and despite a built-in floppy drive it's quite compact. However, in other respects it's been surpassed by newer machines: It's relatively heavy (8.6 pounds traveling weight), the keyboard is awkward, the display is small and wide, and the LTE's street price ($2525 in the *PC World* configuration) is the highest in its class.

The LTE may be heavy, but its size is about average. In short, while this notebook will fit into your briefcase easily, your sandwich may suffer. On the other hand, its battery life is extraordinary. Our informal tests showed nearly 5 hours with normal use.

The LTE has two Achilles' heels: its screen and its keyboard. The screen is quite small, and its 2:1 width-to-height aspect ratio turns circles into eggs and distorts text. The keyboard's dedicated cursor keys fall in an L, instead of the inverted T your fingers expect. <Page Up> and <Page Down> are simulated, as are quite a few other keys. Worst of all, unless you hit the keys hard they don't always make contact.

The machine's performance is the best of any 8086-based notebook we tested, taking top place in all four speed tests.

The LTE's RAM capacity is a cramped 1MB, the lowest count in the roundup. And while most of its design is well thought out, placing the AC power jack (which you need every day) behind a nail-breaking snap-cover at the rear of the machine was a poor decision.

The LTE's excellent battery life means you can work comparatively long hours away from the power plug, and its fleet performance is the best of the inherently poky 8086 CPUs. However, its high price, overly wide screen, poor keyboard, and 8.6-pound weight make it much less competitive than some of the newer kids on the block—and it's still about twice as slow as an 80286.

Toshiba T1000XE

Toshiba's 7.5-pound T1000XE is a perfect example of the dictum less is more —as long as the *less* refers to pounds, inches, and dollars. One of the lightest and least expensive notebooks reviewed (it's only $2348 on the street, in the standard *PC World* configuration), it boasts a terrific screen, a great keyboard, average performance, and a handy outboard floppy drive.

Trade-offs? Though light, the T1000XE is actually a bit large. Moreover, battery life is unimpressive: Under normal use, you'll start seeing low-battery warnings before 2 hours elapse. On the bright side, there's a handy pop-up battery-charge indicator.

The T1000XE's screen is large, bright, and easy to read, and it boasts an aspect ratio that's close to that of a standard CRT. Double-scan CGA gives you text at 640 by 400 pixels (slightly better than EGA resolution), but unless your program supports AT&T's or Toshiba's special 400-line modes, graphics are 200-line CGA. The keyboard is better, with dedicated cursor keys in the standard inverted T, plus dedicated page and function keys. The numeric keypad is simulated, as are a few other keys. Key touch is excellent: full travel, soft landing, and positive key contact.

Compaq's LTE is the fastest 8086-based notebook we tested, and it boasts an outstanding battery life of 5 hours in normal use. Unfortunately, it's relatively heavy.

ROBERT CARDIN

Desktop Features in a Briefcase-Sized Package

Portability (weight and size) and battery life are the critical features in these notebook laptops, and in these categories the machines from Texas Instruments and Sharp score high honors. However, when you look at keyboard ergonomics and street price, Toshiba's T1200XE shines.

● Yes
○ No
◒ Deficient

	8086 Notebooks			80286 Notebooks			
	Compaq LTE	Toshiba T1000XE	Zenith Data Systems MinisPort HD	Compaq LTE/286 Model 20	Sharp PC-6220	Texas Instruments TravelMate 2000	Toshiba T1200XE
Standard features							
Street price[1]	$2525	$2348	$2255	$3675	$3653[2]	$3653[2]	$3238
List price	$3617	$3297	$3198	$4767	$5046[2]	$5046[2]	$4348
CPU	80C86	80C86	80C88	80C286	80C286	80C286	80C286
CPU speed	9.54 MHz	9.54 MHz	10 MHz	12 MHz	12 MHz	12 MHz	12 MHz
Capracessar type and speed	n/a	n/a	n/a	80C287-12	80C287-12	80C287-12	n/a
RAM capacity	1M8	3MB	2M8	2.6MB	3MB	3MB	5M8
Portability							
Traveling weight (paunds)[3]	8.6	7.5	7.5	8.6	7.5	7.5	9.75
Size (inches)	1.9 x 8.5 x 11	1.8 x 10 x 12.2	1.3 x 9.8 x 12.4	1.9 x 8.5 x 11	1.4 x 10.75 x 11	1.4 x 10.75 x 11	2 x 11 x 12.2
Valume (cubic inches)	178	220	158	178	166	166	268
Built-in flappy drive	●	○	○	●	●	●	●
Battery							
Battery life (haurs/minutes)							
Pawer-saving enabled/disabled	6:40/4:55	3:18/1:54	2:20/2:05	6:50/4:30	11:00/5:05	11:00/5:05	2:53/1:59
Charger indicates charge-in-pragress	●	●	○	●	●	●	●
Screen							
Size (square inches)	29	38	26	29	46	46	39
Aspect ratio	2:1	1.57:1	2.6:1	2:1	1.3:1	1.3:1	1.55:1
Display type	CGA	CGA	CGA	CGA	VGA	VGA	CGA
Shades af gray[4]	4	4	4	4	16	16	4
Keyboard							
Dedicated cursar keys	●	●	●	●	●	●	●
Cursar keys in standard inverted T	○	●	●	○	●	●	●
Dedicated page cantral keys	○	●	○	○	●	●	●
Dedicated function keys	●[5]	●	●[5]	●[5]	●[5]	●[5]	●
Service and support							
Warranty periad (months)	12	12	12	12	12	12	12
Free on-site service	◒[6]	◒[6]	○	◒[6]	◒[6]	●	◒[6]
Tall-free tech support	◒[6]	●	◒[6]	◒[6]	●	●	●
Daily support (haurs)	◒[6]	10	◒[6]	◒[6]	8	9	10
BBS	◒[6]	●	◒[6]	◒[6]	●	●	●
					BEST BUY	BEST BUY	

[1] Standard configuration includes 1MB RAM, 2400-bps madem, 20MB hard disk, flappy drive (built-in or outbaard), and DOS.
[2] Estimated; includes add-on "slice" battery.
[3] Includes PC, battery, modem, and AC pawer/charger.
[4] Including black and white.
[5] <F1> through <F10> dedicated; <F11> and <F12> simulated.
[6] At dealer's discretian.

BUYING SMART

A notebook PC may *look* like a laptop, but in reality it's a new product category—with its own buying issues.

Portability For notebooks even more than other laptops, small size and low traveling weight are all-important. At 10 pounds and under, including the PC, the battery, and the AC charger, each of these machines compares excellently with the overall laptop field.

Everyone needs a floppy drive. Three of these notebooks have them built-in, but when portability is primary, I prefer outboard floppies you can leave at home.

Battery Life As the saying goes, "There ain't no such thing as a free lunch." Low weight means light batteries means relatively short battery life. You have a right to demand at least 3 hours of battery life. All these machines let you exchange batteries, so you won't have to stop working if the one in the machine runs low.

Screen All these systems have bright, backlit displays, so the critical issues are display type (VGA is desirable, but only two of the seven have it), size (the bigger the better), and aspect ratio (wide "CinemaScope" screens distort graphics and make text hard to read). Standard displays are usually 1.2:1. Anything wider than 1.6:1 is too wide.

Keyboard The most important keyboard features are dedicated cursor keys (in the familiar inverted T), plus dedicated page and function keys; if these are missing you'll find it harder to switch back and forth between your desktop and the notebook. Reliable key contact, key travel (the distance the key moves before it bottoms out), and "soft landing" (the smoothness with which the springs under the keys cushion the landing) are critical, too.

Price We base our cost comparisons on *street price*. For every machine, we call as many as five PC dealers in each of eight cities (Boston, New York City, Atlanta, Chicago, Dallas, Houston, San Francisco, and Los Angeles) and ask for a quote in the standard *PC World* configuration. Results are averaged.

Neither the Sharp nor the TI was available in stores as we went to press, so we had to estimate street prices (see reviews for details).

RAM Capacity We consider a 2.6MB memory ceiling a minimum requirement. That lets you install a large RAM disk, plenty of expanded memory, and the like. Not everyone will want to run *Windows 2.0* on a notebook, but if you can't live without Microsoft's GUI, 4MB of RAM is none too much.

Performance For most notebook users, performance is not nearly as critical as portability. However, if your roadwork requires high-speed computing, you'll want to buy one of the 286-based systems—they all perform at roughly the same level.

Service and Support All the companies in this roundup handle service and support through dealers, which means features and quality vary from one location to another. To find out how they compare, we made a series of blind calls to dealers around the country.

Most dealers offered 12 months of warranty coverage and an average of 9 hours of daily tech support. On-site service was generally available, but only as an extra-cost option. Weekend support was rare, but most dealers had a fax for technical inquiries. Exceptions are discussed in individual reviews. —*M. G.*

Toshiba prefers its customers to get service and support through dealers, but it also offers a toll-free tech support line. We called three times and averaged 11 minutes on hold before we got an answer.

With a generous 3MB RAM ceiling, the T1000XE provides plenty of overhead for placing a big *1-2-3* spreadsheet in expanded memory, or a RAM disk in extended. (A RAM disk is a great way to save battery life by minimizing hard disk access.) Except for a stiff latch that makes it hard to open the case, design is excellent.

The T1000's short battery life is a shame, especially because its light weight, attractive screen, and outstanding keyboard make it one of the most portable and easy-to-use notebooks in the roundup. However, if you don't mind carrying a few charged batteries and can live without 286 performance, this machine still makes a tempting package.

Zenith Data Systems MinisPort HD

At $2255 on the street (in the *PC World* configuration, with an outboard floppy drive), the MinisPort HD boasts the lowest price of any machine in the roundup. It's also the smallest, and it ties for lowest weight. Unfortunately, not all the news is good: The HD's keyboard and battery life could be better, it's the slowest machine we tested, and its small screen is the worst in the roundup.

This system's portability numbers are impressive. Its weight (7.5 pounds) and size are both excellent. But its 2-hour battery life is only average, and it's the only machine in the roundup to lack a charge-in-progress indicator; without it, there's no way to find out if the battery is fully charged.

The HD's screen is bright and crisp and displays four shades of gray. But it's also the tiniest in the roundup, and so

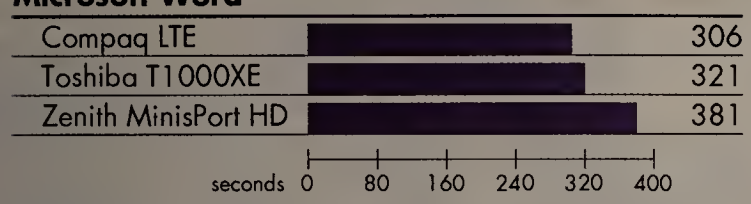
Weight, Not Speed, Distinguishes Notebook PCs

No surprise: 286-based notebooks run rings around 8086-based machines. Within the 8086 category, Compaq's LTE takes top honors. The 286s score so closely that we have to declare a dead heat.

■ Best Buy

8086 Systems

Microsoft Word



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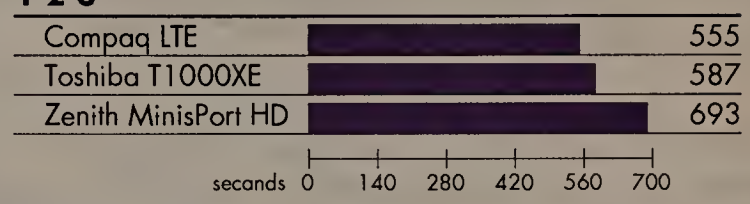
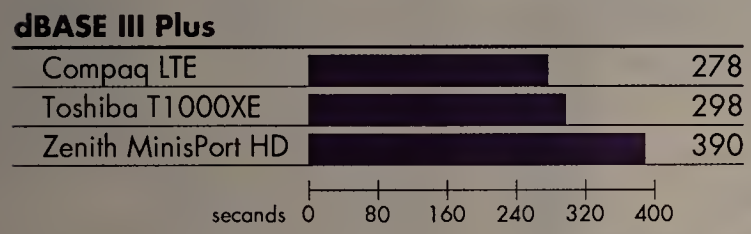
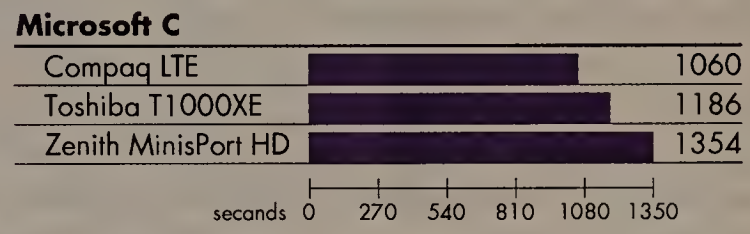


dBASE III Plus

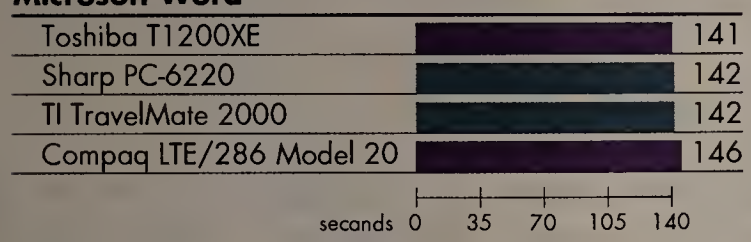


Microsoft C



80286 Systems

Microsoft Word



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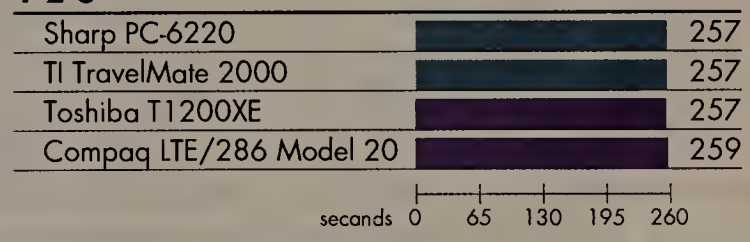
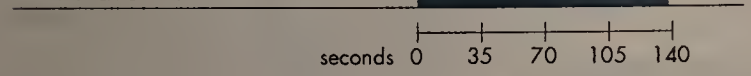
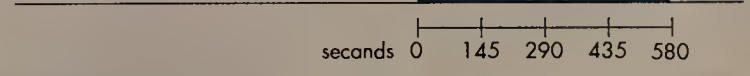


dBASE III Plus



Microsoft C



Methodology
All the computer systems were tested with a 256K disk cache. The 8086 machines had on expanded-memory disk cache; the 80286 machines had an extended-memory disk cache. Systems were tested with the following amounts of RAM: Compaq LTE, Sharp PC-6220, Texas Instruments TravelMate 2000, Toshiba T1200XE, and Zenith MinisPort HD, 1MB; Compaq LTE/286 Model 20, 2.5MB; and Toshiba T1000XE, 3MB. Every computer was tested with the vendor's version of DOS, and each system had a 20MB hard disk.

Microsoft Word 4.0
A *Microsoft Word* macro loads a 35-page, 140-paragraph document and performs search-and-replace and spell-checking operations. The first page of the document is then printed. Although the results of the benchmark depend primarily on processor and memory access speeds, display adapter and hard disk speeds are also contributing factors.

1-2-3 2.01
In this benchmark, a *1-2-3* macro executes a series of recalculations using five different formulas within a 75-by-75-cell matrix. Because there are few screen updates and no disk access is required, the results depend almost entirely on processor and memory access speeds.

dBASE III Plus 1.1
The *dBASE III Plus* test measures the time required to prepare and print a report of past-due invoices. The report includes calculated fields and is based on three files: a 500-record customer file, a 1000-record invoice file, and a 2000-record item file. When disk caching is not used, the random access speed of the hard disk is, after processor speed, the most significant factor in this benchmark. With disk caching, sequential read performance becomes more important than random access.

Microsoft C 5.0
The *Microsoft C* benchmark measures the time required to compile and link *XLISP*. The most important factors in this benchmark are processor and memory access speeds. The performance of the hard disk is also a factor; generally, disk caching has little effect.

Data based on tests designed and conducted by National Software Testing Laboratories (NSTL), Conshohocken, PA 19428. **All rights reserved.**

The MinisPort HD from Zenith is the least expensive notebook in the roundup. It's also the smallest, and it ties for the lowest weight. However, its performance is the slowest of any we tested, and its screen is both tiny and too wide.

wide that circles look more like sausages than eggs. The keyboard has dedicated cursor keys in a true inverted T, and <Enter> and <Backspace> are nice large keys. However, <Page Up> and <Page Down> are simulated, as are many other keys. Touch is excellent, and key contact is reliable.

The HD's 2MB memory ceiling is a bit low. This is especially unfortunate, since it limits the usefulness of the HD's "hard RAM" disk (a RAM disk that preserves your data even when the PC is turned off). The biggest RAM disk you can create is 1408K.

The Zenith MinisPort HD is light, tiny, and inexpensive, and it boasts an impeccable design. Nevertheless, its relatively short battery life and its small, misshapen screen knock it out of the running.

80286 NOTEBOOKS

Compaq LTE/286 Model 20

Compaq's 80286-based notebook, the LTE/286, is virtually identical to the 8086-based LTE. It's got the same miraculous battery life; the same small size; the same middleweight heft; and the same built-in floppy drive, disappointing keyboard, and small display. And like its brother, it's the most expensive machine in its class.

There *are* a few differences: The LTE/286 boasts a higher (2.6MB) ceiling for CPU-speed RAM and offers the useful option of a 40MB hard disk (the only notebook reviewed to do so). And of course with a street price of $3675 (in the *PC World* configuration), it's considerably more expensive.

All the 80286-based notebooks we ran through our speed suite turned in very similar numbers. The LTE/286 beat the crowd on the *Microsoft C* test, but not by much.

Thanks to its faster performance, excellent RAM capacity, and 40MB option, the LTE/286 makes a more tempting package than the LTE. Moreover, like its slower brother's, its battery life is phenomenal. But its wide screen, poor keyboard, and heavy weight make it seem old-fashioned.

Compaq's LTE/286 Model 20 passes the briefcase test with flying colors, and it shares the LTE's 5-hour battery life. Sadly, it also shares a high price.

ROBERT CAPDIN

Sharp PC-6220

Sharp's brand-new PC-6220 is so thin and light, it's hard to believe it's a real hard disk PC and not a toy. It features a big, beautiful VGA screen, amazing battery life, and a good street price (an estimated $3653 in the standard *PC World* configuration, with an outboard floppy and an add-on battery "slice"). Since this machine is the only one in the roundup to offer the option, we included the screw-on battery slice as part of the package—you'd need it for anything but the shortest junket.

The PC-6220 was not yet in the stores as we closed this article. To estimate its street price, we averaged the percentage difference between the list price and the street price for all the machines in this roundup that *were* in stores (27.6 percent), multiplied that by the PC-6220's $5046 list price, and subtracted the result.

The MinisPort HD is light, tiny, and inexpensive, and it boasts impeccable design.

The specs on Sharp's new baby are outstanding: Its traveling weight is a mere 7.5 pounds, and even with the add-on battery attached to the back, it's still one of the smallest notebooks reviewed. The battery delivers over 5 hours of life in normal use—the best in the roundup. (We ran our tests without a modem; your battery life may be shorter with one installed.) If you go with the standard battery, traveling weight drops to 5.6 pounds, but you get only 90 minutes of battery life.

The VGA-compatible screen is bright, crisp, and very large, and it features a conventional aspect ratio. There's even a standard/reverse switch

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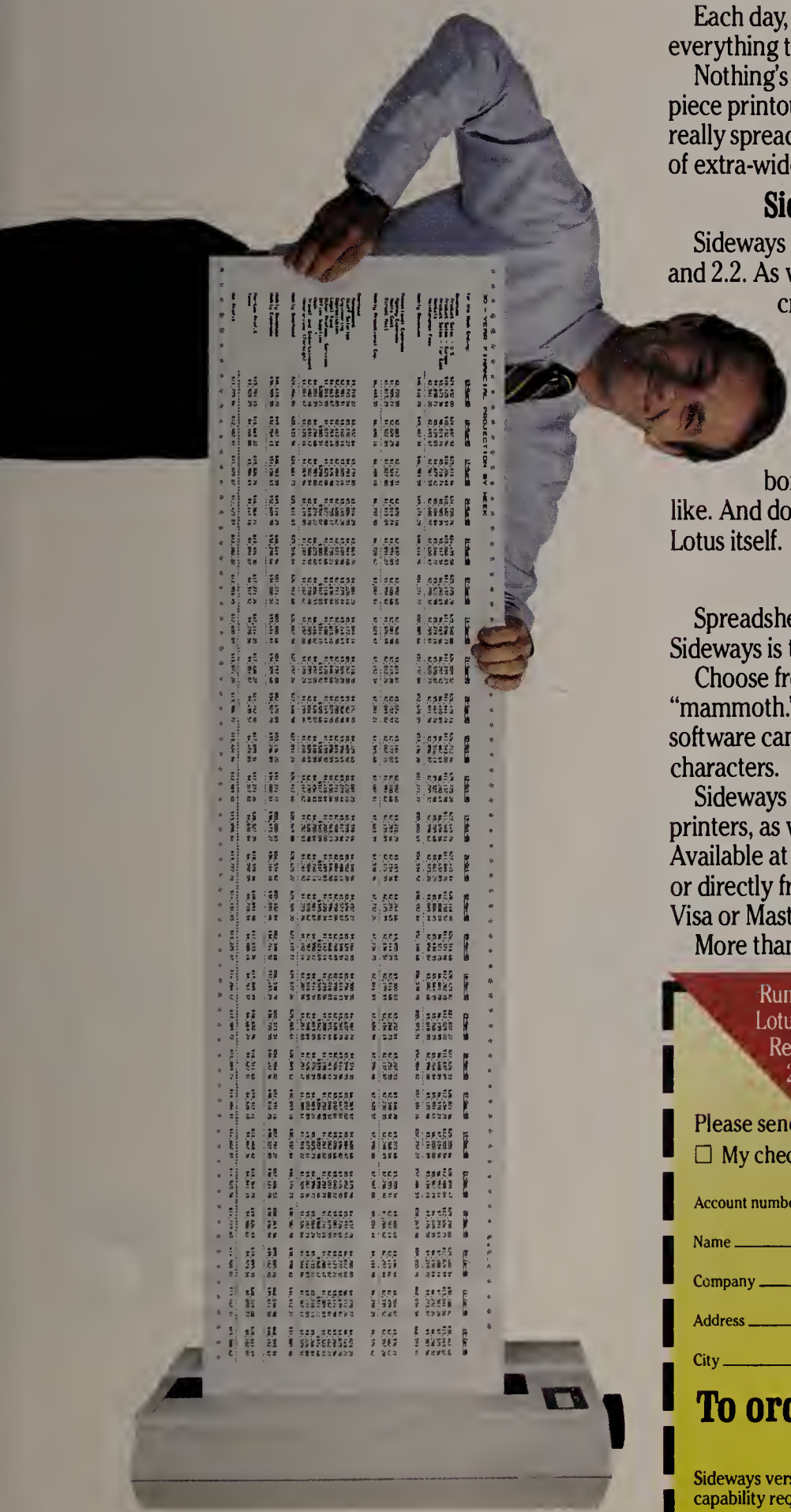

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EXECUTIVE SUMMARY

Nearly Perfect Portables: TI, Sharp Tie for Top Slot

Light notebook laptops deliver portability plus power.

These lightweight, battery-powered, hard disk laptops are extremely easy to carry around, and if you buy wisely, you can get fine screens and battery life too. The perfect keyboard is still on someone's drawing board—although Toshiba's comes close.

The two Best Buys—**TI's TravelMate 2000** and **Sharp's PC-6220**—are really the same machine. Incredibly light and small, they boast terrific VGA screens and excellent battery life. Except for slightly awkward keyboards, they are first-rate. Second-place honors go to Toshiba twice—once for its 8086-based T1000XE and again for its 80286-based T1200XE. Both score Excellent ratings for portability, screen, and keyboard, and the T1200XE rates Excellent on price—but both miss the mark on battery life.

	8086 Notebooks			80286 Notebooks			
	Compaq LTE	Toshiba T1000XE	Zenith Data Systems MiniSport HD	Compaq LTE/286 Model 20	Sharp PC-6220	Texas Instruments TravelMate 2000	Toshiba T1200XE
Portability	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
Battery life	Excellent	Good	Good	Excellent	Excellent	Excellent	Good
Screen	Fair	Excellent	Poor	Fair	Excellent	Excellent	Excellent
Keyboard	Poor	Excellent	Good	Poor	Good	Good	Excellent
RAM capacity	Fair	Excellent	Good	Excellent	Excellent	Excellent	Excellent
Performance	Excellent	Good	Fair	Excellent	Excellent	Excellent	Excellent
Service and support	Fair	Good	Fair	Fair	Good	Fair	Good
Price	Good	Good	Excellent	Good	Good	Good	Excellent
Overall value	Fair	Excellent	Fair	Good	Excellent	Excellent	Excellent
					BEST BUY	BEST BUY	
Reader service no.	686	727	728	686	725	726	727

How we rate notebook computers
We rate notebooks based on information in the Features Evaluation table and the PC World Test Report, combined with our opinions of quality, reliability, and user benefit.

Portability rates size and traveling weight (including PC, battery, modem, and AC adapter). For an Excellent rating to be awarded, we require a size under 300 cubic inches and a traveling weight under 10 pounds.

Battery life also rates battery-charging features. We require at least 3 hours of battery life (with battery-saving options disabled) for an Excellent rating.

Screen groups ergonomic features that make staring at the PC for hours on end as pleasant as possible. To rate Excellent, a notebook's screen must have 350-line (or better) resolution, an aspect ratio no wider than 1.6:1, and the ability to display at least four shades of gray (including black and white).

Keyboard covers features that make it easy to switch back and forth between a standard desktop keyboard and that of the notebook. Dedicated cursor keys in a standard inverted T layout, desktop-quality touch, and dedicated page and function keys yield an Excellent rating.

RAM capacity refers to the total amount of installable RAM. Low capacity can degrade memory-hungry programs' performance and limit access to power-saving options like a large RAM disk. Only notebooks with 2.6MB or more receive an Excellent rating.

Performance scores are calculated within the two categories: 8086-based notebooks are compared to the other 8086 laptops, and the 80286-based notebooks are compared to the other 80286 laptops. To earn an Excellent rating a notebook must excel in at least three-quarters of the benchmarks when tested against the other machines in its class.

Service and support includes the length of the warranty, quality of documentation, quality and availability of phone support, support hours, and other support services. A notebook with at least one year's full warranty, free on-site service, and long support hours merits an Excellent rating.

Price refers to street price. The price of each machine is compared to the others in its class: 8086s against 8086s, 80286s against 80286s. To get an Excellent, a notebook's price must be in the lowest third of the price range for its class.

Overall value takes into account all the above criteria with emphasis on battery life, portability, screen, and keyboard.

mounted handily next to the screen.

The keyboard is clearly one of Sharp's concessions to size and weight. It has very shallow travel, and it flexes as you type! However, key contact is unfailing. The cursor keys are dedicated in a standard inverted T, but the <Page Up>, <Page Down>, <End>, <Home>, <F11>, and <F12> keys are simulated.

Sharp handles service and support through its dealers, but for customer convenience it also provides a toll-free tech support number. We were unable to check promptness, since you can't get past the receptionist without serial and invoice numbers.

The PC-6220's 3MB memory ceiling is excellent, but its case construction is another matter. Connectors (and the battery) are placed behind pop-off cov-

ers, some of which popped off by themselves during normal handling of the machine. Removing some of the other covers took extended prying—and once popped, they proved hard to replace (and easy to lose). In addition, brightness and contrast controls are awkward push-and-turn knobs next to the screen.

Your sandwich is safe with the PC-6220. This notebook is ultralight, ultraslim, and reasonably inexpensive, and it features the best VGA display reviewed. Moreover, like those ultralight airplanes that are designed to flex, its flimsiness may be illusory. But with a machine this light there's always a trade-off—and in this case it's the keyboard. Nonetheless, for most users the effort of adjusting to the PC-6220's keyboard will be easily offset by its amazing portability and battery life. Best Buy? You bet!

FLOPPY DRIVES—LOVE 'EM AND LEAVE 'EM

When laptops weighed 25 pounds and were as bulky as fat briefcases, the size and weight of a built-in floppy drive was negligible compared to its convenience. But now that low-power, low-weight displays and hard disks have reduced notebooks to unprecedented lightness and smallness, we're rethinking our position. A built-in floppy (and the larger case to house it) adds bulk and weight.

There are several reasons why you still need a floppy. While a fast, easy-to-use serial-port file transfer program like *Lap-Link* works perfectly well to move files back and forth between your desktop and your notebook, some applications must be installed from a floppy. Also, if the hard disk ever develops problems, you'll need to be able to boot from a floppy. And if you want to exchange files on the road, it's much easier to use a floppy drive than to hunt up someone who has *Lap-Link* on their PC (or trusts you enough to let you install it).

Unless you expect to use a floppy on every trip, an outboard floppy (which lets you pack the drive when you need it and travel light the rest of the time) makes more sense than a built-in unit. You'll find detailed discussions of floppy options in individual reviews. —*M. G.*

Texas Instruments TravelMate 2000

Texas Instruments (TI) makes the PC-6220 for Sharp and sells it under its own brand name as the TravelMate 2000. Hence, except for a slightly different software bundle, this machine is identical to the PC-6220 in every respect, including the good price, the screw-on battery slice, and the pop-and-drop hatch covers.

Texas Instruments expects customers to go through dealers for service and support. Like Sharp, TI also provides a direct tech support line, but it requires a toll call. Nor was performance impressive: Only two of our three calls were returned, and then only after delays ranging from 3 to 21 hours.

Since TI's and Sharp's machines are essentially the same, the Best Buy recommendation is the same too: Yes!

Toshiba T1200XE

Toshiba's T1200XE is the least expensive 286-based notebook you can buy ($3238 on the street, in the *PC World* configuration). Moreover, it boasts excellent portability and the same fine keyboard and double-scan CGA screen as the 8086-based T1000XE. On the downside, its battery life is nothing to write home about.

The T1200XE's 5MB memory capacity is outstanding.

This 9.75-pound unit (with a built-in floppy drive) is both the heaviest and the largest notebook in the roundup. But compared to most laptops, it still deserves an Excellent rating for portability. Its battery life is a more serious problem; under normal operating conditions, you won't even make 2 hours.

Service and support are identical to that for the T1000XE, reviewed earlier.

The T1200XE's 5MB memory capacity is outstanding, and a utility lets you use that memory for a hard RAM disk. Unfortunately, the T1200XE's ergonomics leave something to be desired. Push-and-turn brightness and contrast knobs are awkward to operate, a stiff latch makes the case hard to open, and the phone plug for the modem is inconveniently placed behind a nail-breaking snap-down hatch cover.

The T1200XE has a lot to recommend it: excellent portability, low price, an outstanding keyboard, a large screen, and a high RAM ceiling. Battery life could be better, but given the realities of the product category, this is still one of the best notebooks you can buy.

Portability Is Prime

This new batch of hard disk notebooks comes closer than ever before to rewriting the tale of two trade-offs (no hard disk, short-lived batteries). The two Best Buys, the Sharp PC-6220 and the TI TravelMate 2000, deliver outstanding portability along with astonishing battery life—and their VGA screens are terrific. Their only significant trade-off is a less-than-fabulous keyboard.

The two Toshibas (the T1000XE and

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the T1200XE) boast fine portability too, plus excellent keyboards and screens—but their battery life is less than 2 hours. Both the Compaqs (LTE and LTE/286) feature excellent battery life, but they're expensive—and they fall down on screen and keyboard.

Clearly, there's still some way to go, but as trade-offs between power and portability grow fewer, these notebooks are looking more and more like the PCs of the future.

Michael Goodwin is an associate editor for PC World.

For more information about all products in this article, circle reader service no. 909.

WHERE TO BUY

Compaq LTE, Compaq LTE/286 Model 20
Compaq Computer Corp.
P.O. Box 692000
Houston, TX
77269-2000
800/231-0900
LIST PRICE: LTE with 640K RAM, 1.44MB floppy drive, and 20MB hard disk $2699; LTE/286 Model 20 with 640K RAM, built-in 1.44MB floppy drive, and 20MB hard disk $3499
ACCESSORIES: 12-MHz 80C287 coprocessor (LTE/286) $799; expanded memory upgrade board with 384K RAM (LTE) $349, 1MB memory expansion board with 1MB RAM (LTE/286) $699, 2MB memory expansion board with 2MB RAM (LTE/286) $1299; external 360K floppy drive $275, external 1.2MB floppy drive $275, external 1.44MB floppy drive $275; 20MB hard disk $799, 40MB hard disk (LTE/286) $1199; 2400-bps internal modem $449; DOS 3.31 $120, DOS 4.01 $150, OS/2 1.1 or 1.21 (LTE/286) $340; external numeric keypad $119; external fast charger/AC adapter $199, automobile power adapter $129; battery pack $129; carrying case $89
WARRANTY: one year parts and labor
EXTENDED WARRANTY: none
TECHNICAL SUPPORT: via dealer
OTHER SUPPORT: none
Reader service no. 686

Sharp PC-6220
Sharp Electronics Corp.
Sharp Plaza
Mahwah, NJ 07439
201/529-9500,
201/529-8919 (fax)
LIST PRICE: with 1MB of RAM, 20MB hard disk, DOS 4.01 $3999
ACCESSORIES: 1MB RAM upgrade $499; outboard 1.44MB floppy drive $299; 2400-bps Send Fax internal modem $499; external numeric keypad $99; add-on battery pack $249; internal battery $129; carrying case $69, all-accessory carrying case $99; video interface card $149; expansion unit $699
WARRANTY: one year parts and labor
EXTENDED WARRANTY: available
TECHNICAL SUPPORT: toll-free number, M–F 9–5; fax
OTHER SUPPORT: in-house BBS
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Texas Instruments TravelMate 2000
Texas Instruments, Inc.
P.O. Box 202230
Austin, TX
78720-2230
800/527-3500
LIST PRICE: with 1MB RAM, 20MB hard disk, DOS 4.01 $3999
ACCESSORIES: 12-MHz 80C287 coprocessor $799; 1MB RAM upgrade $549; outboard 1.44MB floppy drive $299; 2400-bps Send Fax internal modem $499; external numeric keypad $99; add-on battery pack $249; extra internal battery $129; carrying case $99; video interface card $149
WARRANTY: one year parts and labor standard; one year with overnight exchange $84; one year with on-site service $132
EXTENDED WARRANTY: none
TECHNICAL SUPPORT: toll number, M–F 8–5; fax
OTHER SUPPORT: none
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Toshiba T1000XE, Toshiba T1200XE
Toshiba America Information Systems, Inc.
Computer Systems Division
9740 Irvine Blvd.
Irvine, CA
92713-9724
800/334-3445
LIST PRICE: T1000XE with 1MB RAM and 20MB hard disk $2699; T1200XE with 1MB RAM, built-in 1.44MB floppy drive, 20MB hard disk $3999
ACCESSORIES: 1MB RAM (T1000XE) $599, 2MB RAM (T1000XE) $999, 2MB RAM (T1200XE) $1099; external 360K floppy drive $499, external 1.44MB floppy drive $249; 2400-bps internal modem $349; DOS 3.3 $99, DOS 4.01 $120; external numeric keypad $99; external recharger/AC adapter $349, automobile power adapter $129; battery pack (1700 mAh) $79, battery pack (2200 mAh, for T1200XE only) $129; carrying case $99
WARRANTY: one year parts and labor
EXTENDED WARRANTY: available
TECHNICAL SUPPORT: toll-free number, M–F 7–5
OTHER SUPPORT: BBS
Reader service no. 727

Zenith Data Systems MinisPort HD
Zenith Data Systems
1501 Feehanville Dr.
Mount Prospect, IL
60056
800/553-0331,
708/699-3898 (fax)
LIST PRICE: with 1MB RAM, external 720K floppy drive, 20MB hard disk, DOS 3.3 Plus $2799
ACCESSORIES: 1MB RAM expansion board with 1MB RAM $799; external 360K floppy drive $399, external 720K floppy drive $299; 1200-bps internal modem $149, 2400-bps internal modem $399; battery charger 110/220 VAC $109; battery pack $79; carrying case $59; slipcover $12
WARRANTY: one year parts and labor
EXTENDED WARRANTY: available
TECHNICAL SUPPORT: via dealer
OTHER SUPPORT: none
Reader service no. 728

POWER TIP NO. 134

Adding Text to Excel Graphs

It's very easy to add free-floating text to *Excel* graphs. In an active graph window with no graph elements selected, just type your text. When you press <Enter>, the text appears in a box that you can move or resize. You can also change the box's font, colors, or borders.

Robert Lauriston
Associate Editor

DR DOS 5.0.
WE COULDN'T HAVE SAID IT BETTER.

THE NATIONAL NEWSPAPER OF CORPORATE MICROCOMPUTING

PC WEEK

IBM Launches New Consulting Program

Specialists Will Analyze Clients' Businesses with Eye Toward Modernizing Host-Based Applications.

See Page 145.

SPECTRA

D-14 Sunday, May 20, 1990 ★ ★

JOHN C. DVORAK

ASK DVORAK

graphical user interface designed to be used equally well with a keyboard or a mouse. ViewMAX allows for easy execution of DOS commands and "point and shoot" running of any application software, eliminating the need for users to learn and correctly execute cryptic DOS commands. The user's disk layout can be viewed as icons, text or in a graphical tree format.

Users who need to transfer data from one machine to the other can do so easily with FileLINK, a file transfer utility included in DR-DOS 5.0. FileLINK provides easy, high-speed transfer of files and programs between systems over standard serial cables. The utility installs itself from one machine to the other via the serial link, so DR-DOS 5.0-based systems can communicate with machines running MS functional DOS operating systems.

A major advance in DR-DOS

DRI To Upstage Giants With Own DOS 5.0

By Gina Smith

Users hungry for the memory relief promised by DOS 5.0 will be able to buy the system software next month—but not from IBM or Microsoft Corp.

Digital Research Inc. (DRI) is poised to release DR-DOS 5.0, the latest version of its DOS-compatible operating system. Early users and company officials say it offers many of the key features planned for Microsoft's unannounced DOS 5.0.

DR-DOS 5.0 is the first commercial version of the previously OEM product. Its most noteworthy feature is a memory-management capability that allows users to free as much as 620K bytes of memory for application use, said Dick Williams, president of DRI in Monterey, Calif.

Although Microsoft officials have said that a new DOS version with similar features will be shipped by year's end, sources say that version is in the very early stages of development.

"Microsoft is only promising this, and DRI will be shipping soon. If [DR-DOS] can prove it's really compatible, and if it looks good, I'd have no problem recommending it," said Bob Hollingsworth, a computing consultant for an automobile maker in Detroit.

"I don't care whose name is on the package if it can help us with our memory problem," said Darrin McCarthy, end-user computing analyst with Porsche Cars North America Inc. in Reno, Nev.

Beta testers report that DR-DOS 5.0 includes a number of features not found in current MS-DOS and PC-DOS versions. Among them are a graphical,

See DRI Page 6

San Francisco Examiner

BUSINESS

Key NewWave Office Elements Due This Month

FIRST LOOK

Turbo C++ Delivers Power To Programmers

So what's all the hoopla about?

MemoryMAX™ for one thing. A breakthrough in memory management that can give you more than 620K so you can run today's memory-intensive applications, including, for example, dBASE IV® on Novell NetWare®.

In fact, John Dvorak calls MemoryMAX nothing short of "amazing."

The Press goes on to mention that because DR DOS 5.0 is fully DOS compatible, you can run all your current DOS applications. And because it is easy to install and requires no hard disk reformatting, upgrading to DR DOS is simple. Since DR DOS 5.0 also includes ViewMAX™, a graphical interface, DOS is easier than ever to use.

Now if we could just get a word in edgewise, we would simply like to add that DR DOS 5.0 is available now. Call us at (800) 443-4200 today.

DR DOS 5.0

Digital Research®
WE MAKE COMPUTERS WORK

For Laptop and Notebook manufacturers, DR DOS 5.0 is fully executable from either RAM or ROM. And, it's available with BatteryMAX™, a battery-saving feature that can increase battery life 2–3 times (dependent upon OEM implementation).

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Circle 51 on reader service card

Four SQL Data Bases:

Mainframe Muscle in a PC Package

OS/2 SQL data base servers from IBM, Microsoft, Oracle, and Gupta promise mainframe performance over affordable PC networks. Until SQL front ends arrive in force, though, the development challenges may be too much for most users.

Tyler Band

SCOTT BALDWIN

Until recently, PCs couldn't come close to performing the key function of minicomputers and mainframes: providing many users shared access to huge quantities of data. But as today's 386- and 486-based network servers gain gigabyte-sized hard disks and fault-tolerance features, putting a mainframe-sized data base at the hub of a PC local area network (LAN) is becoming a real possibility.

Unfortunately, conventional PC-based multiuser data managers aren't up to the task. As the number of users grows and the size of the data base increases to big-iron proportions, programs such as *dBASE* and *Paradox* bog down miserably. Furthermore, the security and data integrity features of the typical PC-based data managers can't measure up to those of large-system products.

The computer industry's proposed solution is the *data base server*, a software engine that runs on the LAN server and provides data processing services for the entire network. With conventional multiuser data managers, workstations do all the processing and often must download entire files from the LAN server to run a simple query—a good way to cause LAN congestion. Data base servers cut traffic drastically by doing the job *at the server*, sending the workstation only the records that match the query.

Today's most promising data base servers use Structured Query Language (SQL), a nonprocedural language popular with mini and mainframe data base programmers. SQL data base servers provide not only better performance on large LANs than do conventional data bases, but also improved security and reliability—plus the potential to link with mainframe SQL data bases.

The most exciting development, however, is that a host of PC software developers are teaching their applications to speak SQL. As a result, instead of having to learn a new application to query the company data base, you'll be able to use your favorite data manager or spreadsheet (see the sidebar "Uncomplicating SQL: Easy Front Ends Are the Puzzle's Final Piece").

But make no mistake: SQL servers are bleeding-edge technology. This review of four SQL data base servers—IBM OS/2 Extended Edition 1.2's Database Manager, *Oracle Server for OS/2 1.0*, Gupta's *SQLBase Server for OS/2 4.0.1*, and Microsoft's *SQL Server 1.0*—clearly demonstrates that you can't overestimate the difficulty of setting up a data base using any of these products. The bottom line is that if you're committed to making SQL server power available *now*, you'll need a good data base programmer and plenty of time to get things up and running.

The Price of Power

Any multiuser data base needs the services of an experienced developer. With conventional multiuser data managers, setting up the data tables themselves is fairly trivial. But to keep users from corrupting the data base, you need custom-written front ends.

dBASE IV, *R:base*, *Paradox*, and *Advanced Revelation*—virtually all the major PC data managers—include tools (many menu-driven) that ease application development. By contrast, the programming aids that come with Database Manager, *Oracle Server*, *SQL Server*, and *SQLBase Server* are either primitive or difficult to use. In addition, the developer needs fluency in two languages—SQL, plus C, COBOL, or one of the other languages these products understand—to set up tables and complete an application. And since none of the programs offers modern debugging tools for SQL code, trial and error is the order of the day.

In a conventional multiuser data base, a programmer builds data validation into a custom front end to keep you from entering invalid part numbers, changing past income, putting text in a numerical field, and so on. But again, with SQL server data bases, you'll want to build data validation into the data

Queries Are Simpler With SQL

dBASE

```
clear all
set talk off
use salary index sindex1
select 2
use roster index rindex1
set relation to ss_num into salary
select 3
use grades index gindex1
set relation to emp_num into roster
set filter to left(roster->lname,1)='L'
list EMP_NUM, roster->LNAME, roster->FNAME,;
  salary->SALARY, GRADE
clear all
set talk on
```

SQL

```
select emp_num, lname, fname, salary, grade
from grades, roster, salary
where roster.emp_num = grades.emp_num and roster.ss_num = salary.ss_num and lname like 'L%'
order by emp_num
```

Querying is much simpler using Structured Query language than it is with the dBASE language. In this example, displaying five fields from three related tables takes 13 arcane dBASE III Plus commands but requires only 1 straightforward, English-like SQL command.

SCOTT BALDWIN

SQL Server: Peerless Security, Superior Programming

Wide support by a variety of front ends, rock-solid data security features, and top administrative and programming powers put SQL Server ahead of the competition.

● Yes
○ No
◒ Deficient
△ Limited only by available RAM

Standard features	IBM Database Manager	Oracle Server for OS/2 1.0	SQLBase Server for OS/2 4.0.1	SQL Server 1.0
Price	$B30[1]	$3699	$2495	$2495
Maximum number of simultaneous users[2]	△	40	△	250
Minimum RAM required/ additional RAM required per user	9.5MB/ 150K	8MB/ 250K–512K	4MB/ 3K	8MB/ 42K
Multiple active data bases	●	○	●	●
Data base can span disk volumes	○	●	○	●
Workstation query-report utility	◒[3,4]	●[4]	○	○
Compatibility				
Available front ends				
1-2-3	◒[5]	●	●	●
Excel	◒[5]	◒[5]	●	◒[5]
DataEase SQL	◒[5]	◒[5]	○	◒[5]
Paradox SQL Link	◒[5]	◒[5]	○	◒[5]
Advanced Revelation	◒[5]	◒[5]	○	◒[5]
IBM OS/2 Extended Edition Query Manager	●	○	○	○
LAN support				
NetWare	○	●	◒[6]	●
LAN Manager	○	●	◒[6]	●
NETBIOS-compatible LANs	○	●	●	○
Banyan VINES	○	●	◒[6]	○
Import delimited ASCII files	●	●	●	●
Import graphics	○	○	◒[7]	●
Administration				
Manage selected users as group	●	●	○	●
Back up active data base	○	○	●	●
Auditing (activity log)	○	●	●	◒[8]
Monitoring (real-time)	○	●	●	●
Terminate selected-user process	○	○	○	●
Compress data base	●	○	○	●
On-line help	●	◒[9]	○	●
Tutorial	○	○	●	●

Data security	IBM Database Manager	Oracle Server for OS/2 1.0	SQLBase Server for OS/2 4.0.1	SQL Server 1.0
Exclusive locks	●	●	●	●
Shared locks	●	●	●	●
Primary-key referential integrity	●	●	●	●
Foreign-key referential integrity	●	○	○	◒[8]
Enforce business rules	○	○	○	●
Transaction rollback	●	●	●	●
Transaction roll-forward	○	●	●	●
Programming				
Languages supported				
C	●	●	◒[4]	●
COBOL	●	●	◒[4]	●
BASIC	○	○	○	●
FORTRAN	●	●	○	○
Pascal	●	○	○	○
Proprietary procedural language	●	○	◒[4]	●
Windows tool kit	●	○	◒[4]	●
Server-based subroutines	○	○	○	●
Query syntax optimizer	●	○	●	●
Delete column	○	○	●	○
Rename column	○	●	●	●
Set default column values	○	○	◒[10]	●
Aliasing	○	●	●	●
Outer joins	○	●	●	●
Auto date-time stamp	○	●	○	●
Turnkey programming services	○	●[4]	●[4]	○

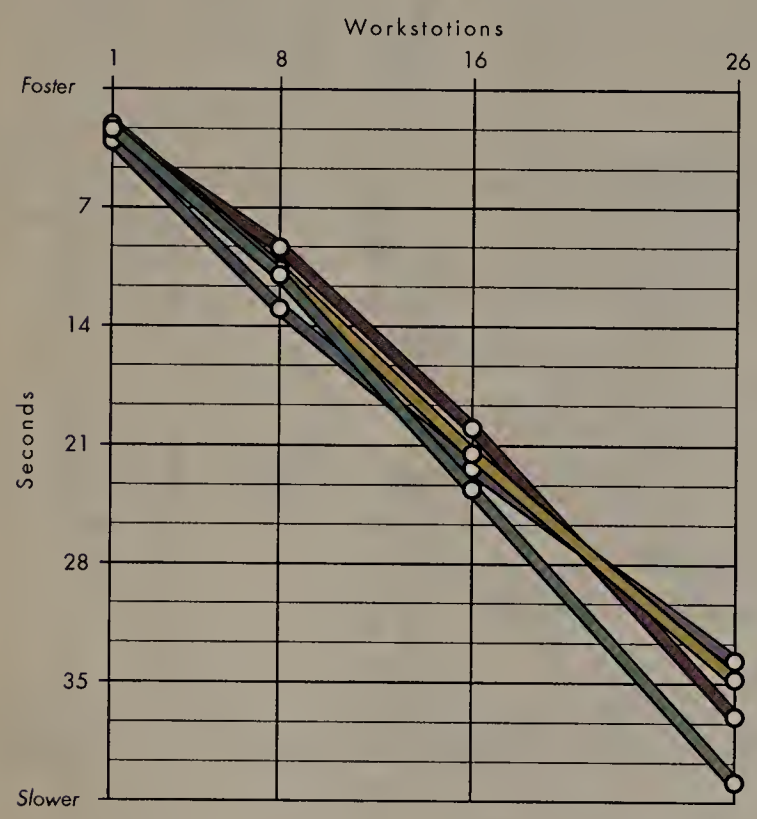
[1] Price is for IBM OS/2 Extended Edition 1.2, which includes Database Manager.
[2] Actual maximum number of users will depend on amount of RAM in server.
[3] IBM OS/2 Extended Edition 1.2 workstations only.
[4] Available at extra cost.
[5] Announced but not shipping at press time.
[6] DOS workstations must run NETBIOS.
[7] Fields limited to 32K.
[8] Only by manually programmed triggers.
[9] Only for some functions.
[10] Set to zero or current date only.

PC WORLD TEST REPORT

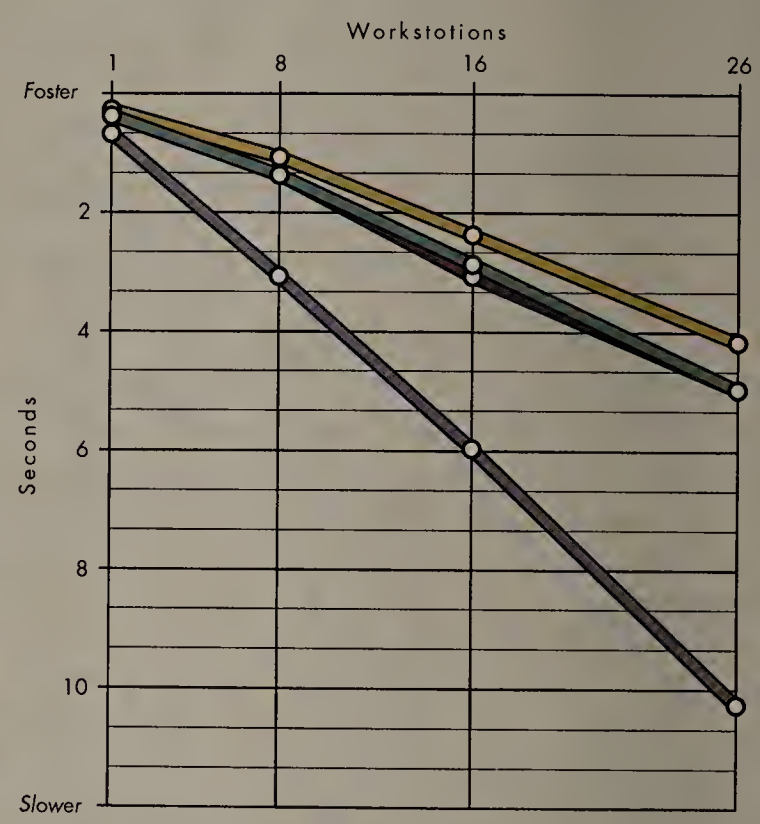
Fast Service From SQL Server

Microsoft's SQL Server provides the best overall performance and holds up best under heavy loads. Oracle Server and Gupta's SQLBase are close behind, but IBM OS/2 Extended Edition's Database Manager trails badly.

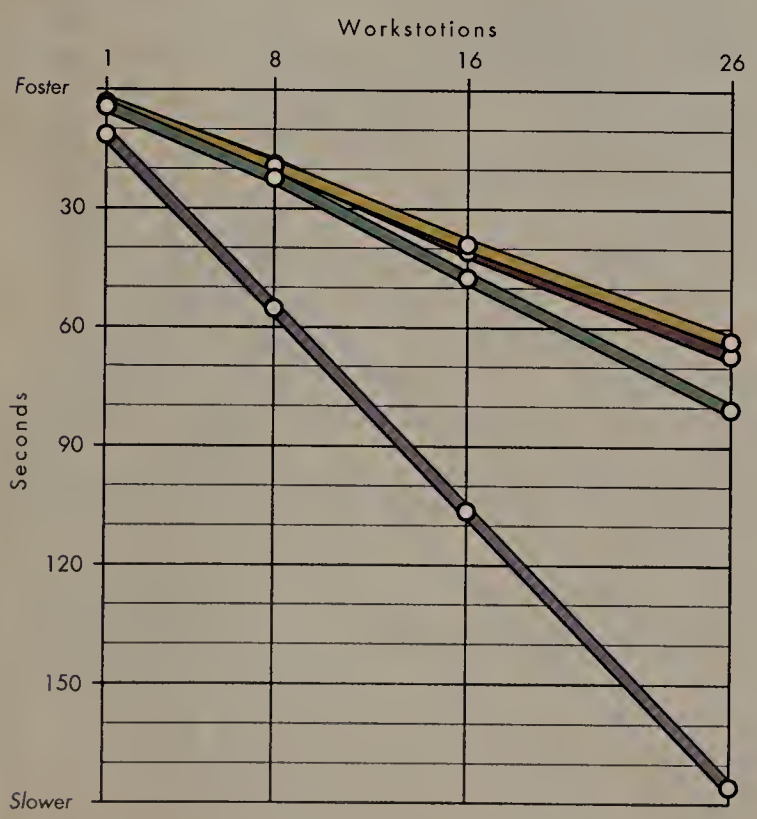
Order



Payment



Author



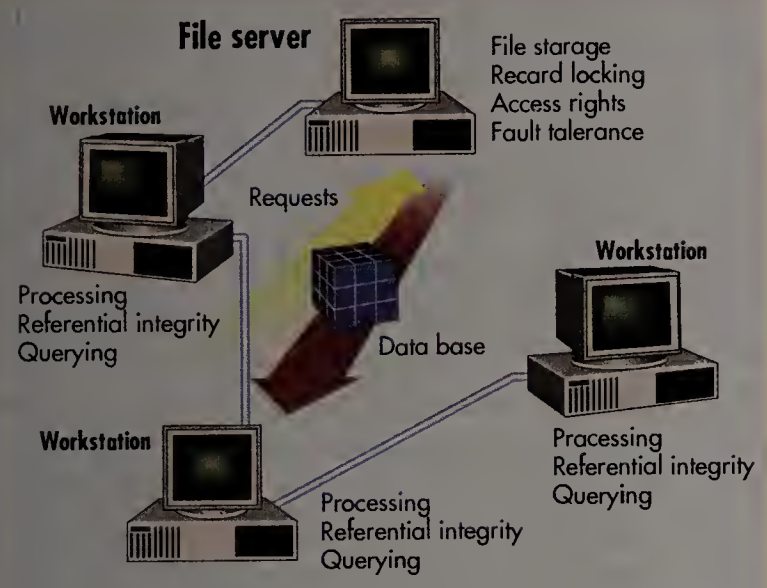
IBM Oracle SQL Server SQLBase

Methodology
A 25-MHz IBM PS/2 Model 80 with two 300MB hard disks and 16MB of RAM acted as both LAN server and data base server. Workstations were 16-MHz Everex Step/386si SX systems with 4MB of RAM and IBM Token-Ring adapters. For every program except IBM OS/2 Extended Edition, the server used IBM OS/2 1.1 as the operating system. The workstations used Compaq OS/2 1.1, and the network used the 3Com *3+ Open 1.1* operating system. IBM OS/2 Extended Edition used its integrated operating system, Communications Manager, and Database Manager. All programs were set up to use one hard disk for the data base and the other for log files.

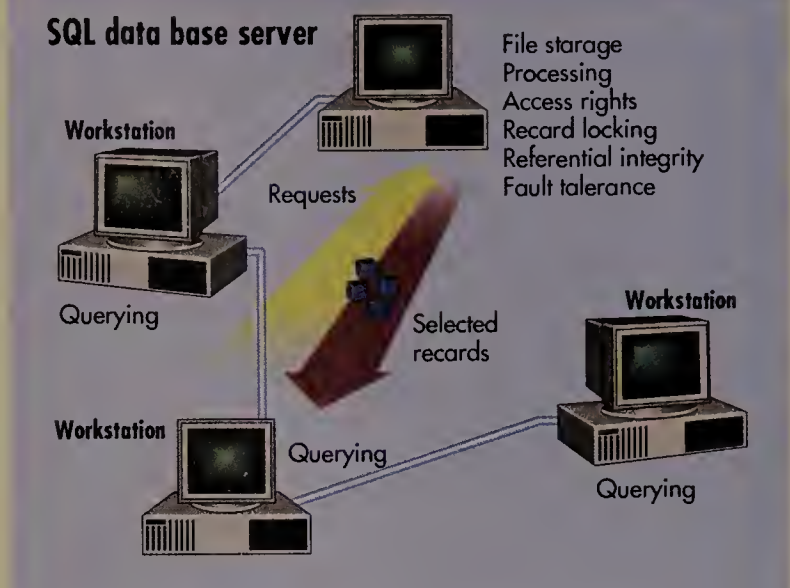
The three tests simulate various aspects of a single transaction-processing system based on a hypothetical book-selling business. In the Order test, each transaction creates an order for five books selected at random. Transactions in the Author test select a single book by the author's name. Payment test transactions pick an order at random, invoice it, and update inventory.

Data based on tests designed and conducted by National Software Testing Laboratories (NSTL), Conshohocken, PA 19428. **All rights reserved.**

Data Base Servers Cut LAN Traffic, Speed Up Queries



In a conventional multiuser data base, the file server does little work; processing and enforcement of referential integrity are performed by the workstations. This results in heavy LAN traffic and makes major demands on workstations' CPUs.



In a SQL data base server, data base management, data security, and transaction processing are handled entirely by the server, reducing LAN traffic. Since workstations don't have to work so hard, good performance is possible even with older, slower PCs.

base itself. If you're going to offer access to users through SQL versions of *1-2-3, Paradox, DataEase* and so on, you *must* consolidate data validation on the server to protect the integrity of your data—even if you've written a custom front end for data entry (something most businesses that maintain large data bases will do in any event).

In the future, developers will supposedly be able to set up a data base—from the data tables, to security, to custom front ends—using SQL versions of popular PC data managers (see the sidebar "Data Base Alternatives: Client-Server Computing Without OS/2"). Until then, you need to find a fearless bilingual programmer with lots of free time, or wait until an in-house developer gets up to speed in SQL.

Choose Your Engine

Obviously, electing to buy into SQL server technology is no casual choice. Perhaps you've just added a couple of users to your tried-and-true multiuser data base, and even with powerful PC hardware you're starting to get complaints about performance. Or you're planning on setting up a shop full of data entry clerks, and your consultant whips out a VAX brochure.

In other words, the time to consider a SQL server is when a mini or mainframe is the only other solution. Assuming you're primed to take the plunge, consider the following buying issues:

Compatibility The crucial factor in choosing a SQL server is the selection of compatible third-party front ends. These must be written for a specific server, so if your office has standardized on *Paradox*, for example, you should select a server that *Paradox* supports in order to avoid retraining.

At this writing, *SQL Server* enjoys the lion's share of support—compatible versions of *1-2-3, Advanced Revelation, DataEase, Excel* (with the *Q+E* add-in), and *Paradox* are all either shipping or will be released shortly. Vendors seem to be taking more time supporting the other servers, but only *SQLBase* is short on major vendors with announced plans for front ends.

Of the four servers reviewed, only Database Manager and *Oracle Server* offer front ends that enable users to query and revise data and generate reports. Although Database Manager has the better user interface, you'd probably prefer to use a third-party front end or write your own.

LAN compatibility is also crucial—unless you're willing to switch network operating systems to suit your data base server. *Oracle* and *SQLBase* can handle all major LANs, and *SQL Server* talks to both *LAN Manager* and NetWare, but Database Manager runs only with *LAN Server 1.2*.

Administration All four programs are basically easy to install. And all but *SQLBase* have the key administrative feature: the ability to assign access rights to users in *user groups*.

Access rights are usually assigned by department and job position—personnel clerks can view all information in the employee file except salary, for example. User groups are merely predefined sets of privileges; you can change a user's access rights merely by moving him or her from one group to another. Without user groups, you must assign access rights to files, records, and fields one user at a time.

The ability to back up an active data base is also important; without it, you can't have round-the-clock access to the

KEITH BAUMANN

system. In addition, the ability to monitor data base activity (both in real time and in an activity log) has its uses—it's helpful for fine-tuning performance, spotting ill-behaved applications, and identifying users who attempt unauthorized access.

Data Security This category includes four elements: access rights, locks, referential integrity, and fault tolerance. The four programs have identical SQL-standard capabilities that enable administrators to assign different levels of access to different users. In addition, all four programs have in common one serious limitation: You can't generate a full report of rights granted, but instead have to generate a separate report for each user or group.

Locks determine how a server arbitrates simultaneous attempts to access the same data. When someone updates a record, an *exclusive lock* kicks in and prevents anyone else from viewing or revising that record. A *shared lock* permits more than one user at a time to query or view a record. All four servers have these two basic lock types.

Referential integrity prevents users from corrupting the data base with bad entries. *Primary-key* referential integrity, found in all the servers, requires each entry in a column to contain a unique value (such as a record number), prohibiting duplicate records. Only Database Manager, however, has *foreign-key* referential integrity, which restricts entries in a column to those values that can be found in a specific column in another table—limiting packing slips to valid part numbers, for example. Programmers can add foreign-key integrity to *SQL Server* data bases by writing special routines; in *Oracle* and *SQLBase,* the front end must handle this task.

Fault tolerance helps avoid loss or corruption of data due to a system crash or power failure. Transactions are recorded in a log file (kept on a separate hard disk for added safety). After a crash, this log file lets the data base administrator "roll back" incomplete transactions, removing the partial updates from the data base, or "roll forward" completed transactions, writing the remaining data to disk. Database Manager has only rollback; the others have both.

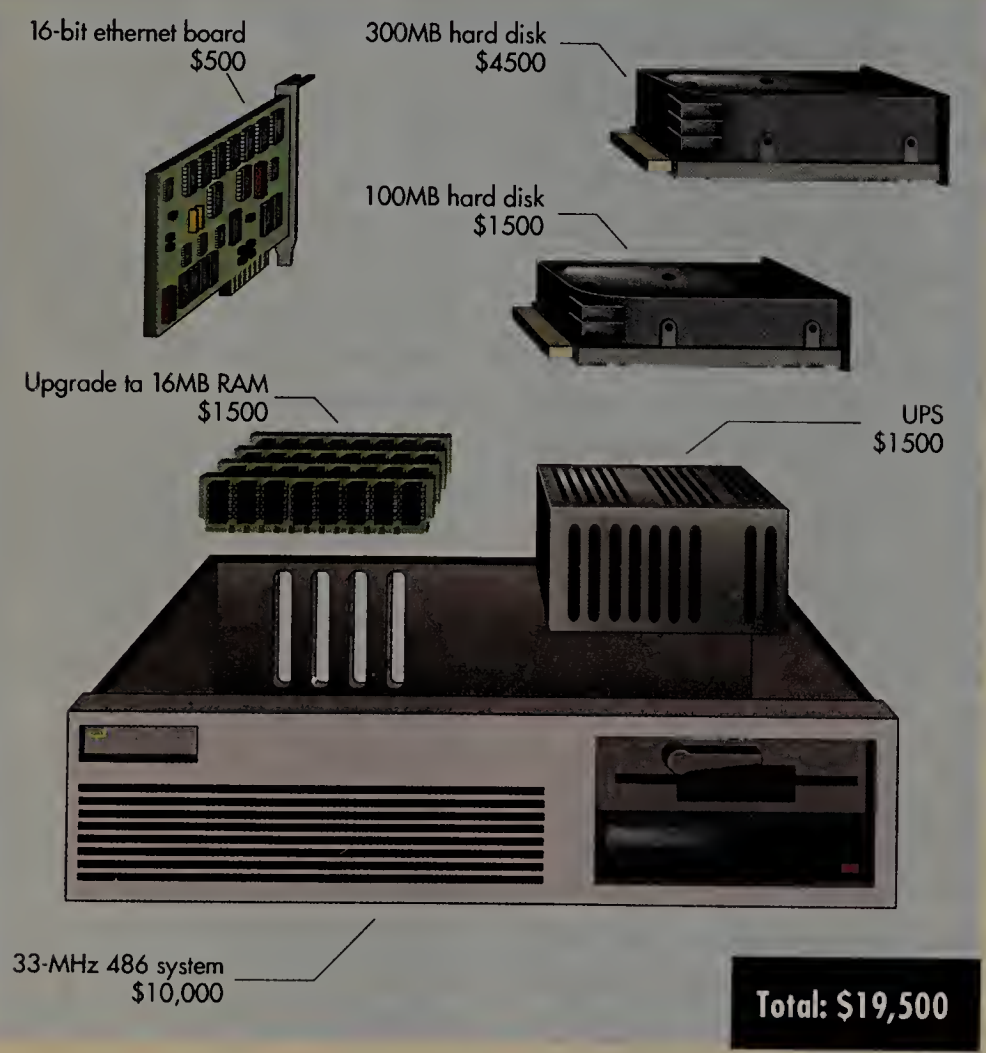
Performance Each of our three performance benchmarks simulated a typical transaction-processing task. We ran each benchmark with 1, 8, 16, and 26 workstations to determine the degree of performance decay that occurs with additional users. For three of the servers, the performance differences were slight; however, Database Manager's performance fell well below the rest in two tests.

Programming It's important that a server support a variety of languages. Although all can be programmed with C or COBOL, *SQL Server* is the only one that speaks BASIC. More important, *SQL Server* lets you write subroutines and run them on the server—giving you tremendous flexibility in creating server-based data validation.

Price Since developing a single data base application will likely cost much more than the server software does, price is not an issue. However, you may want to figure cost over the long term based on the maximum number of users each server supports.

Surprisingly, the number of simultaneous users the servers can handle varies widely. *Oracle* accommodates only 40 users; *SQL Server,* 250; Database Manager and *SQLBase* have no fixed limit. However, since each user who logs in takes up some of the server's memory,

Heavy Hardware for SQL Servers



For top performance, a SQL data base server needs the fastest system and hard disk you can afford, with a full 16MB of RAM. The second, smaller hard disk holds transaction log files, and an uninterruptible power supply (UPS) gives extra protection against power failures. While the server's price tag may appear high for a PC, it's only a fraction of the cost of the minicomputer or mainframe it displaces; maintenance costs are also lower.

KEITH BAUMANN

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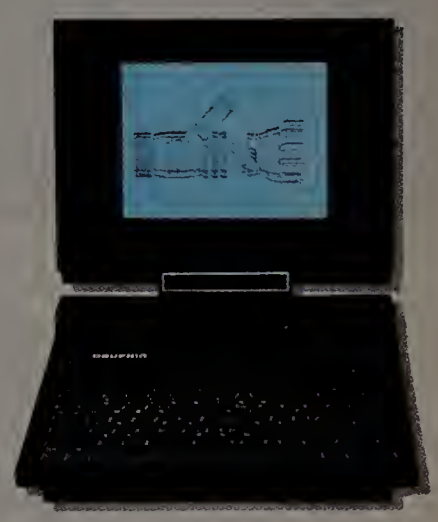
THE DAUPHIN 1000 SERIES*



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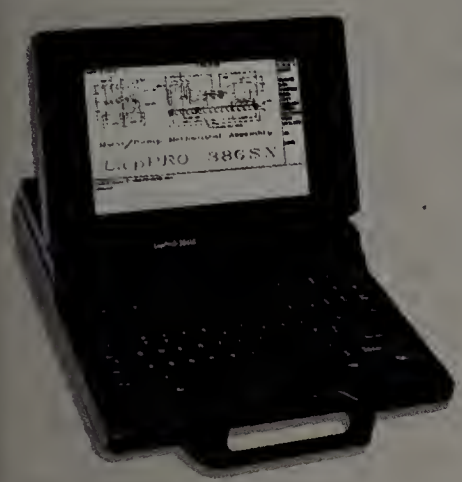

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BOOTH N3622 FALL COMDEX 1990

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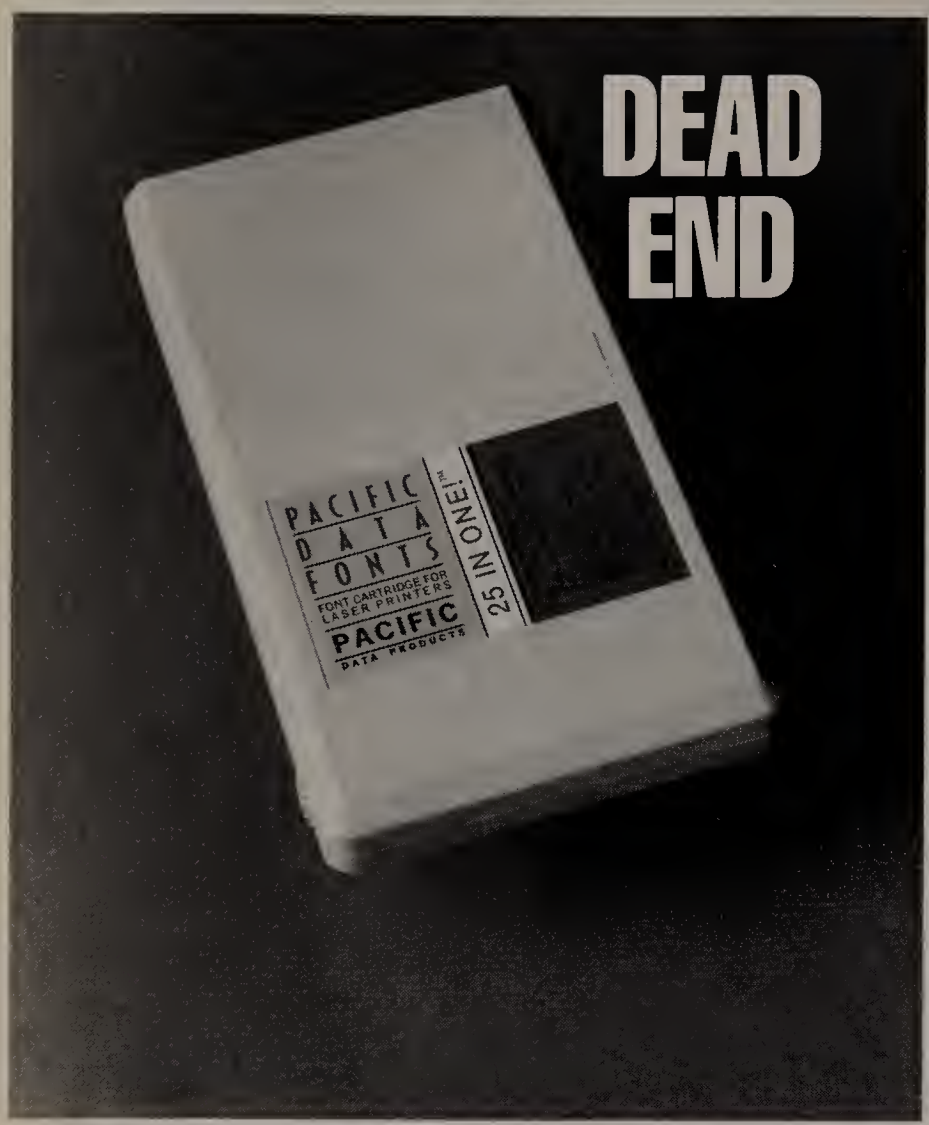

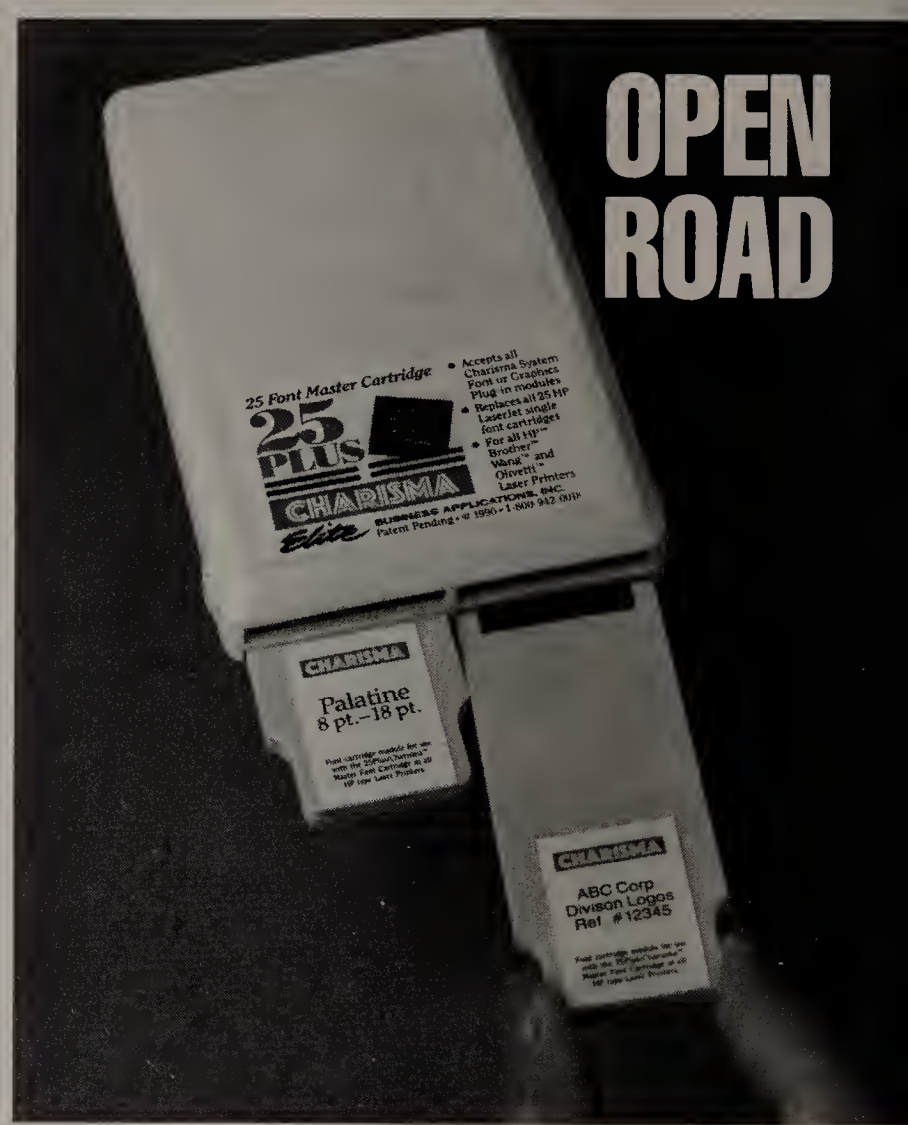

It's easy to see the differences between these two exceptional font cartridges, but here's a closer look.

FEATURE	25 IN ONE!™	25 PLUS/CHARISMA
All 25 HP "A-Z" Font Cartridges	Yes	Yes
100% HP Compatible with LJ, II, IID, IIP, III	Requires an additional cartridge	Yes
Actual Number of Type Choices	69	77
Symbol Sets	20	22
Bar Codes & Postal Codes	No	Yes
Z Bats	No	Yes
Maximum Point Size	18 points	Unlimited with modules
Spreadsheet Sizes	3.6 points	3.6, 4.8 points
Headline Sizes (24-48 points)	Requires a $399 additional cartridge	Unlimited with modules
Accepts Additional Fonts	No	Unlimited with modules
Custom Forms/Graphics	No	Unlimited with modules
Drivers for Most Programs	Yes	Yes
Cartridge Price	$399.00	$399.00
Module Price	NA	$99.00
Expansion Potential	None	Unlimited

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all four programs are constrained by OS/2's 16MB RAM ceiling. The more memory each user requires, and the greater the amount of RAM required by the SQL server itself, the fewer users the server can handle. *SQL Server* and *SQLBase* have much lighter RAM requirements than Database Manager and *Oracle.*

IBM OS/2 Extended Edition 1.2's Database Manager

Extended Edition's Database Manager is the hardest to administer of the four servers. It's a real test of IBM loyalty: To use DOS workstations you have to run *IBM LAN Server 1.2,* which in turn demands that the file server be a PS/2. Worst of all, in two of three *PC World* tests, Database Manager was only half as fast as the other three products.

The only Database Manager front end available at this writing is another Extended Edition module, Query Manager. Its menu-driven Presentation Manager interface lets OS/2 users easily perform ad hoc queries, set up data entry screens, and run reports. This is the best dedicated front end of the group. IBM has no solution for DOS and *Windows* users, but at least most of the companies working on SQL front ends plan to support Database Manager.

Database Manager is installed as part of IBM's OS/2 Extended Edition 1.2 (it can't be run under earlier OS/2 versions or those from other vendors), and the many options and features call for careful preinstallation planning. The server needs a minimum of 9.5MB of RAM, plus an additional 150K for each workstation. Combined with the 16MB OS/2 RAM ceiling, that means Database Manager is limited to about 45 users.

Although Database Manager supports user groups, administration is difficult, because it's not completely centralized. The administrator must go to each workstation and manually enter configurations for each data base that the station needs to access—a waste of time. You can't back up an active data base, and Data Manager lacks auditing and monitoring tools.

Database Manager's single advantage over the other products is its foreign-key referential integrity. Otherwise, Database Manager is the only server that lacks roll-forward, making it more likely to lose data after a system crash. During tests, a programming er-

EXECUTIVE SUMMARY

SQL Data Bases: Ready or Not

Data servers offer new capabilities—and new complexity.

SQL data base servers are faster and more reliable than conventional multiuser products, can handle larger data bases, and will soon let users access data using their favorite spreadsheet or DBMS. But programming a SQL data base server is currently so difficult that you should consider one only when your alternative is using a mini or a mainframe.

SQL Server is clearly the best of the four servers reviewed, but it's just too hard to use to merit a Best Buy. This difficulty should be reduced with the arrival of SQL versions of easy-to-use DBMS's like Paradox and DataEase, which promise to let nonprofessionals develop **SQL Server** applications.

	IBM OS/2 Extended Edition 1.2's Database Manager	Oracle Server for OS/2 1.0	SQLBase Server for OS/2 4.0.1	SQL Server 1.0
Compatibility	Poor	Good	Fair	Good
Administration	Fair	Fair	Poor	Good
Data security	Fair	Fair	Fair	Excellent
Programming	Fair	Fair	Fair	Good
Performance	Poor	Good	Good	Good
Ease of use	Poor	Poor	Poor	Fair
Overall value	Fair	Fair	Fair	Good
Reader service no.	665	666	667	668

How we rate SQL data base servers
We rate these servers based on information in the Features Evaluation table and the PC World Test Report, combined with our opinions of quality, reliability, ease of use, and user benefit.

Compatibility reflects the voriety of user front ends avoilable and under development for the server, LAN types supported, and flexibility of data import. An Excellent rating requires a query and report utility, front-end support by all majar third-porty developers, compatibility with all major LAN operating systems, and the ability to import delimited ASCII and graphics files.

Administration measures the strength of tools pravided for data base administrators, including installation; management of users, groups, and tables; backup; auditing; monitoring; and data base compressian. An Excellent rating requires comprehensive tools for all those tasks and the ability to back up active data bases.

Data security includes access rights, locks, referential integrity, and fault tolerance. To be rated Excellent, o server must hove exclusive and shared locks; primary-key, fareign-key, and business-rule referential integrity; and transaction rollback and roll-forward.

Programming measures the strength of tools pravided for doto base developers, including programming-language support, tool kits, debugging tools, and internal features like column delete and aliasing. To receive an Excellent rating, a program has to offer a simple interactive develapment environment in which to build, test, and debug applications.

Performance ratings compore the products' scores in the PC World Test Report. A server that exhibits superior performance in every test receives an Excellent rating.

Ease of use measures haw intuitive and accessible a program is and applies to all the criteria. For an Excellent rating, a program must have logically nomed menu chaices for all basic functians, and cleor explanatians of other important tasks must be eosy to find in the program's anline help.

Overall value takes into account the abave criteria, plus reliability, capacity, and price.

UNCOMPLICATING SQL: EASY FRONT ENDS ARE THE PUZZLE'S FINAL PIECE

Roberta Furger

It's taken more than a year longer than anyone expected, but PC users can finally choose from a variety of familiar business applications that can function as front ends for SQL data base servers.

One reason for the wait is that each front end must be designed to hook to a specific server. You'd expect to be able to mix and match front ends and servers; after all, these are *SQL* servers, and all front ends hook to the servers by sending SQL commands. However, each server uses a slightly different version of SQL—which means, for example, that an upcoming edition of *Paradox* that works with Microsoft's *SQL Server* won't work with Gupta's *SQLBase Server*.

This complicated state of affairs means that the issue of which product works with what is vital to your server buying decision. Release dates were still slippery at press time, but the following represents the latest information on front-end support for various SQL servers.

Data Base Tools

The long-awaited SQL versions of big PC data bases are beginning to arrive, with one notable exception: Ashton-Tate's *dBASE Server Edition* has yet to ship, and officials at the Torrance, California, company aren't commenting on expected delivery dates.

Hoping to capitalize on *dBASE Server*'s long delay are Borland and DataEase. Both companies should be shipping SQL-ready products by the time you read this. Borland's *Paradox 3.5* (see the preview in this issue), together with its *SQL Link*, will access *SQL Server*, *Oracle Server*, and IBM Extended Edition's Database Manager. In its first release, *DataEase SQL* will support *SQL Server*; Database Manager and Oracle Server support will follow (see *Product Outlook* in this issue).

SQL-fluent *Advanced Revelation 2.0* from Revelation Technologies should be out by now. Users will need to purchase separate modules depending on which server is installed: The *SQL Server* product will be available during the third quarter, with support for *Oracle Server* and Database Manager to follow by the end of the first quarter of 1991.

WordTech Systems was one of the first data base developers to offer access to SQL servers. Custom versions of its programs, *Oracle dBXL* and *Oracle Quicksilver*, support *Oracle Server*. In addition, *Quicksilver SQL* from WordTech supports Gupta's *SQLBase Server*, and the company plans to support both Novell's *NetWare SQL* and Database Manager, although no delivery dates have been announced.

Nantucket Corporation and Fox Software both plan to include support for SQL data base servers in their *dBASE*-compatible products, but don't expect the hooks anytime soon. Nantucket expects to have drivers to link *Clipper 5.0* applications with SQL servers sometime during the first quarter of 1991. Fox Software will sell its own *FaxServer*, which *FoxPro* will support. With the release of *FaxPro 2.2* later this year, Fox will also offer a stand-alone compiler that will include specifications to allow third-party developers to write drivers linking *FaxPro* to other SQL servers.

Spreadsheet Links

Not everyone, however, wants or needs a relational data base. Many business users will feel more at home—and will find a more appropriate solution—using a spreadsheet to access SQL servers (see "The Spreadsheet Connection: From Data Base to Decision," September 1990).

Microsoft provides the link via *Excel* using the *Q+E* add-in from Pioneer Software. The *Windows* version, which supports *SQL Server*, is available now; the OS/2 version will support *SQL Server* and Database Manager and is due out this month. Support for *Oracle Server* is slated for November.

Users of *1-2-3* versions 2.01 and 2.2 gain access to *SQL Server* via *@SQL*, a Lotus add-in. *1-2-3* release 3 and higher includes support for external data bases within the base package, so users need only purchase the appropriate driver—from either Lotus or the data base server developer—to complete the link. A *SQL Server* driver is available now. Drivers for *Oracle Server* and Extended Edition will follow.

Developers are also introducing general-purpose querying tools, such as *SQL Commander*, a *Windows* and OS/2 application from Strategic Technologies Group. The company claims to offer point-and-click access to SQL data bases. Two servers are currently supported: *SQLBase Server* and *SQL Server*. *SQL Commander* supports DDE (Dynamic Data Exchange), so users can easily bring selected data into applications, such as word processors, that don't provide direct access to SQL server data.

Finally, a Choice

The recent flurry of activity from front-end developers is good news. As the final piece of the SQL data base server technology falls into place, users will be able to choose the front-end applications that best suit their needs.

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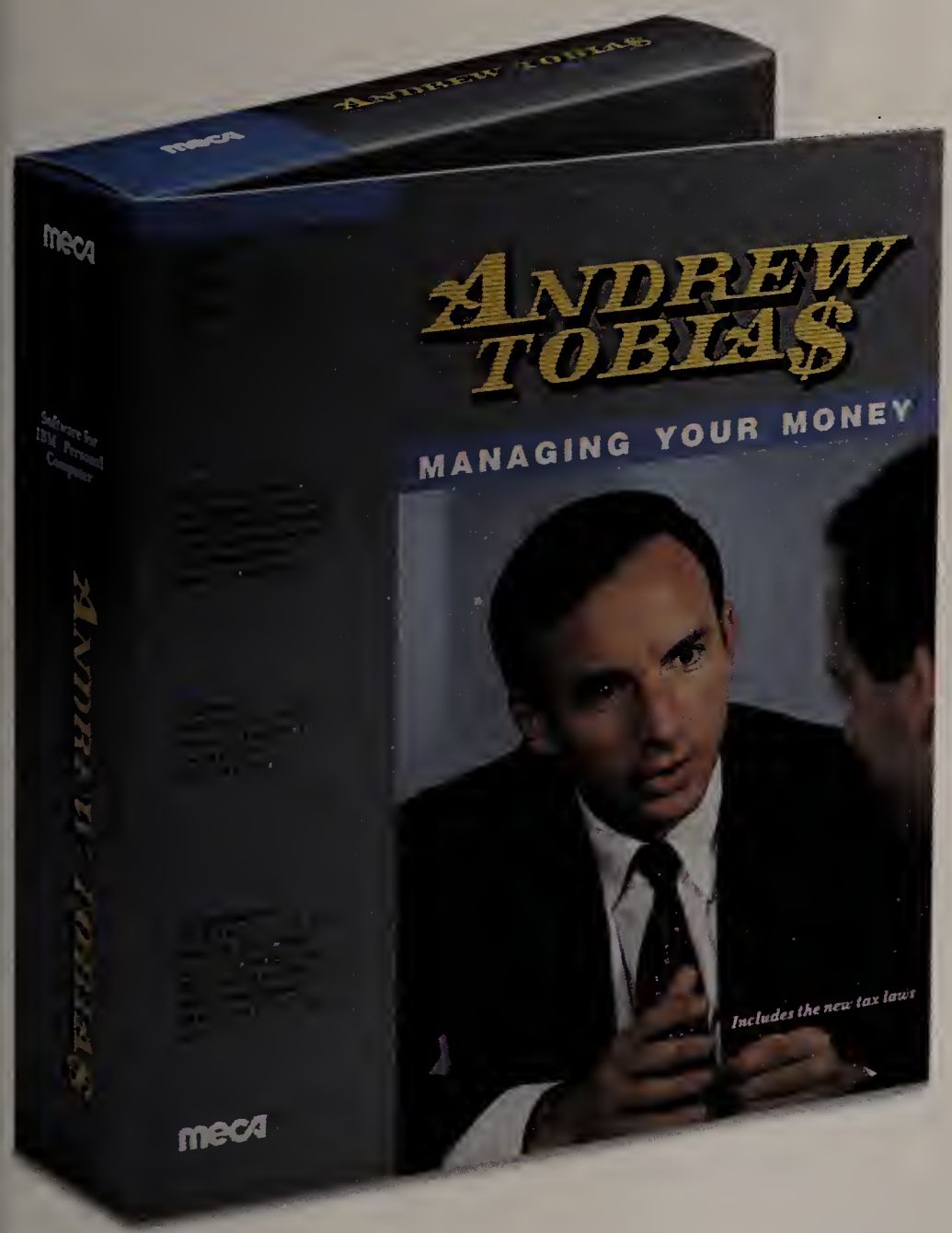

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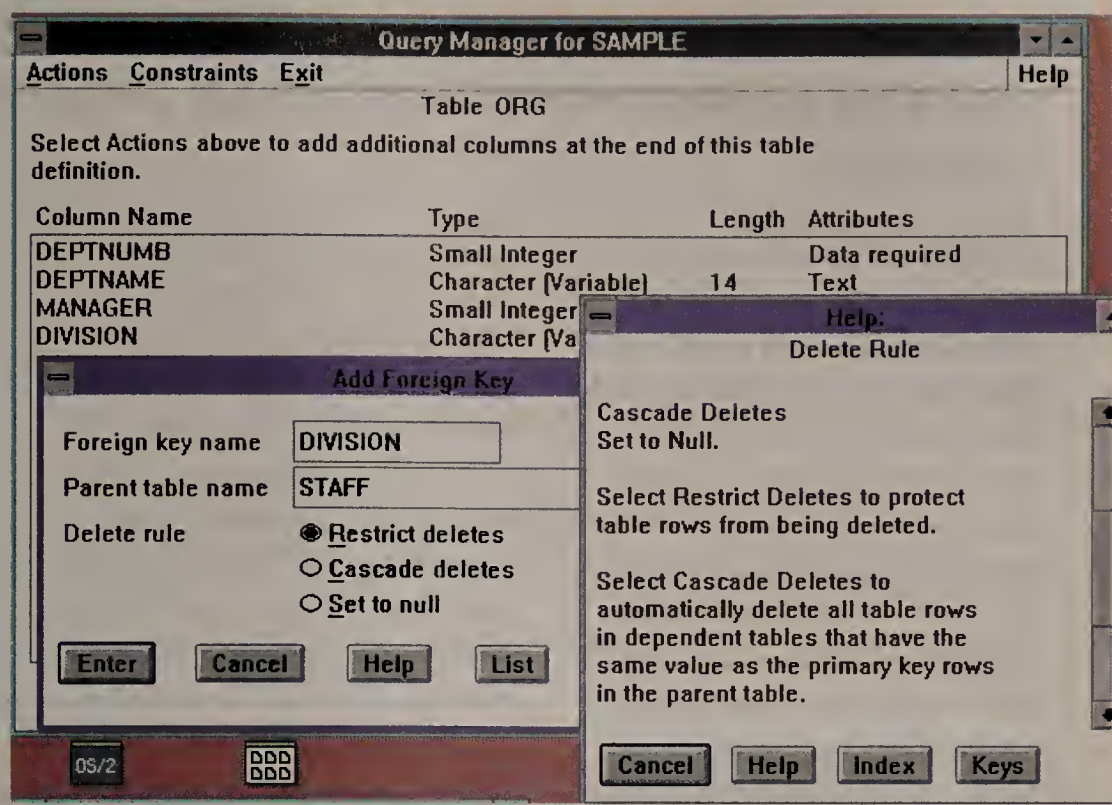
ror (an attempt to fetch data from an unopened cursor) caused the server to crash, and the data base could not be recovered.

While the other data base servers allow programmers to work in DOS, Database Manager insists that they use an Extended Edition workstation. The program includes a procedural batch language, REXX; programs written in REXX are similar to *SQL Server*'s server-based subroutines but not nearly as useful.

Database Manager's limited compatibility puts it out of the running for all but the staunchest IBM loyalists. Poor performance, clumsy administration, and the lack of roll-forward should further deter users.



IBM OS/2 Extended Edition's Query Manager eases setting up a Database Manager data base. Here, a programmer sets up a foreign-key reference with a few simple menu choices.

Oracle Server for OS/2 1.0

Oracle Corporation was one of the first developers of SQL data base engines for minis and mainframes—and *Oracle Server for OS/2* shows its lineage. Its programming interface is crude, and because it lacks a query syntax optimizer, it requires careful attention to programming guidelines and time-consuming manual tuning. You may well need to employ the services of one of the company's many programmers, who can be hired to build, tune, and maintain data bases for users daunted by the product's complexity.

Oracle sells user query and reporting tools for DOS, *Windows,* and even Macintosh workstations, and most major players plan to supply front ends. *Oracle* also sells a variety of off-the-shelf financial and accounting software packages that include both data bases and custom front ends.

Oracle supports all major network operating systems, and it's the only product reviewed that can reroute queries to another server. It can send queries to two servers simultaneously to join tables; however, if one server commits and the other server can't complete the transaction, the data bases will be out of sync.

Oracle requires 8MB of RAM, plus between 250K and 512K more for each logged-in workstation. Running with OS/2, the data base may not be able to handle more than 32 simultaneous users, since that operating system is limited to 16MB of RAM.

Despite a broad variety of administrative tools, *Oracle* comes up short on key features. You can't back up an active data base, and after a number of workstations crash, you must shut the server down and restart to clear the unfinished sessions. There are many utilities for performance monitoring and data base tuning, but there's also a preponderance of cryptic mainframe-style codes you have to decipher with a reference manual. The only way to add referential integrity for foreign keys is with a custom front end. That means you can't let users update data with third-party front ends unless you're willing to risk corrupting the data base. Oracle promises a future release that will include a procedural language enabling you to build foreign-key integrity into the server.

In *PC World*'s benchmark tests, *Oracle* was very close to *SQL Server* in overall performance. But in the real world, when the number of records fluctuates unpredictably and the number of users is not constant, Oracle will not provide consistent performance—unless you tune it continually.

Because *Oracle* doesn't optimize SQL queries automatically, the data base programmer must have a thorough knowledge of SQL; a slight change in syntax can dramatically alter performance. Oracle offers a precompiler for faster, easier programming, but it produces inefficient code: A benchmark written with it ran only half as fast as the benchmark used in the tests.

On the bright side, Oracle offers programmers the widest variety of tools. There are report writers, menu builders, and excellent CASE tools.

Oracle is extremely flexible but unreasonably complex. The most likely home for this product is in an office that's already running mini or mainframe versions of *Oracle,* enabling applications to be moved between large systems and the LAN. For the rest of the world, *Oracle Server for OS/2*'s limited referential integrity, administrative problems, and mainframe-style

DATA BASE ALTERNATIVES: CLIENT-SERVER COMPUTING WITHOUT OS/2

Lincoln Spector

Although OS/2 is clearly the platform of choice among SQL data base server vendors, it's not the only game in town. Several servers are available on DOS or Novell's NetWare. Due to memory constraints, DOS-based servers can handle fewer simultaneous users before performance starts to degrade, but they may be a good, low-cost choice if you want to investigate client-server computing without committing yourself to OS/2. With its better memory management, NetWare should be a for more powerful platform, but it currently suffers from a lack of development support. Once there are more tools available for writing NetWare 386 client-server applications in the form of NetWare Loadable Modules (NLMs), NetWare-based servers may take off.

Many of these non-OS/2 servers aren't expected to compete head-to-head with the likes of IBM and Microsoft. Rather, they're designed to provide the vendors' installed base with a pathway to the client-server world and a way to improve performance at overloaded transaction-processing sites. Here are some contenders in the DOS and NetWare arenas:

NetWare SQL 2.10. Novell's *NetWare SQL* has been shipping since 1988 but has attracted scant front-end support compared with the OS/2 servers. Less sophisticated than the OS/2 servers, *NetWare SQL* is essentially a translator between SQL front ends and Novell's *Btrieve*, a non-SQL data base aimed at developers. The programs let both SQL and *Btrieve* front ends access the same data on NetWare LANs. Security, locking, and validation are done at the *Btrieve* level, but *NetWare SQL* currently lacks referential integrity features. Front ends include Novell's *NetWare XQL* development package, Concentric Data's *R&R for SQL*, and a driver for *1-2-3* release 3. Promised for the future is support from *Advanced Revelation, Alpha Four, Paradox, Quicksilver,* and *dBXL*.

Informix-OnLine 4.0. A competitor with Oracle in the UNIX world, Informix is a late entry in the server wars. A NetWare 386 version of *Informix-OnLine*, a SQL data base server currently available on UNIX, is expected by the end of this year. Like *SQL Server, OnLine* can incorporate any type of data into a data base, enabling you to store scanned photos, formatted documents, or even sound recordings along with conventional data. Initially, front-end support will be limited to Informix's *Informix 4GL* data manager and the upcoming *Windows* version of its *Wingz* spreadsheet.

XDB-Server. Another UNIX migrant, XDB Systems' *XDB-Server* comes in NetWare and DOS versions, with an OS/2 entry on the way. Its main claim to fame is its strict DB2 SQL compatibility and the fact that its DOS version can run in as little as 400K. XDB's data manager, report writer, forms manager, and COBOL and C development tools all support *XDB-Server*, but *R&R for SQL* is its only major third-party front end.

Emerald Bay Database Server 2.1. If you have a *dBASE* shop, and you're not ready to switch to SQL, you might consider Ratliff Software's *Emerald Bay Database Server*, a *dBASE*-style server by Wayne Ratliff, the original author of *dBASE II*. DOS-based, it runs in 640K. Unlike standard *dBASE, Emerald Bay* combines multiple tables, indexes, validation, and security into a single file, making it possible for multiple programs to access the same data safely. The few front ends available include Ratliff's *1-2-3 2.01* add-in, its *dBASE* clone and compiler, and its C and Pascal libraries, as well as Successware's *Clipper* library, *Clip2dB*.

Undoubtedly, more entries will appear, and more OS/2 servers may be on the way. Details are scarce about one longtime vaporware server, Microrim's *Vanguard*, but the project is still alive. Meanwhile, the momentum in data base servers is towards OS/2.

WHERE TO BUY

NetWare SQL 2.10
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Emerald Bay Database Server 2.1
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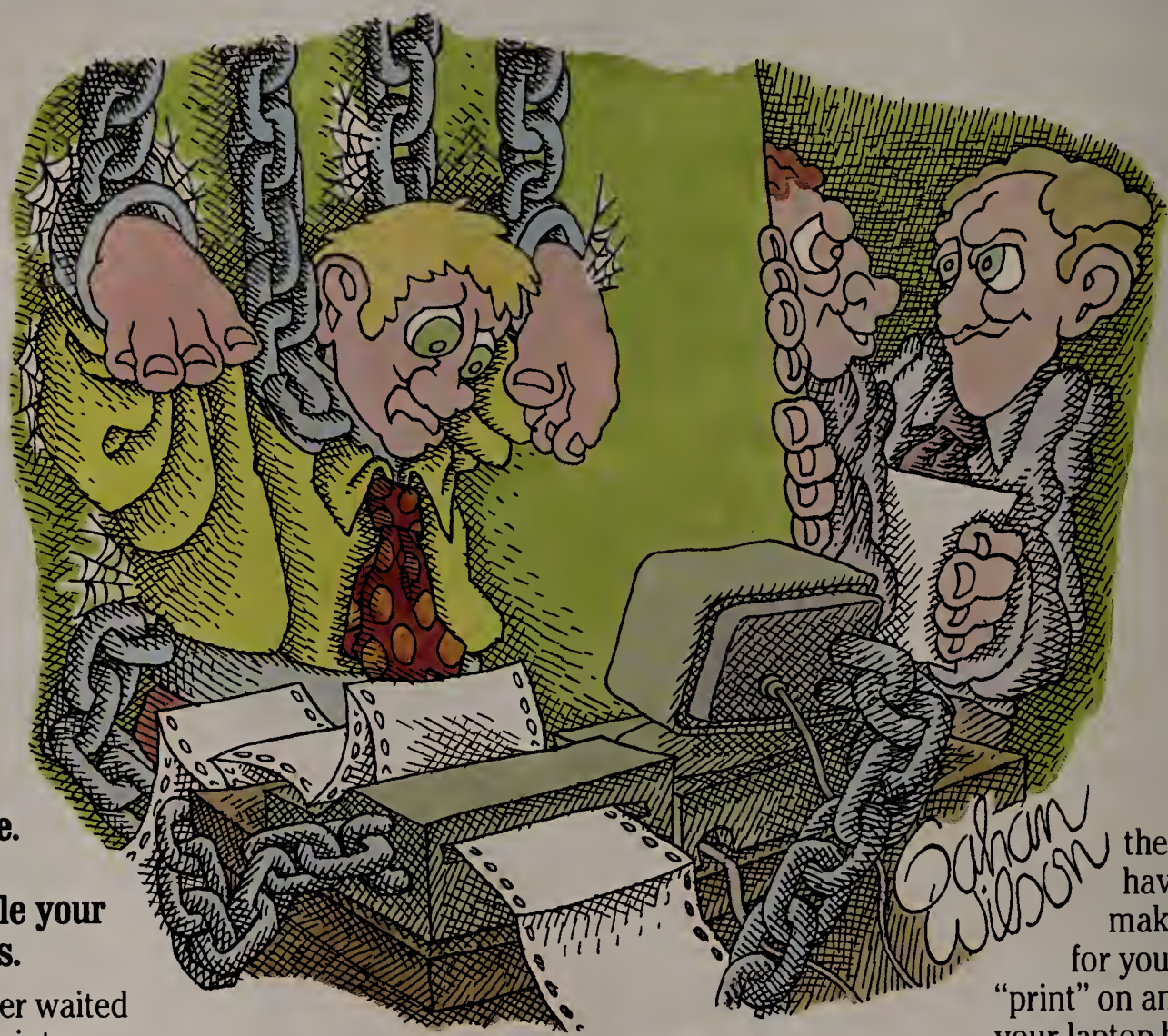

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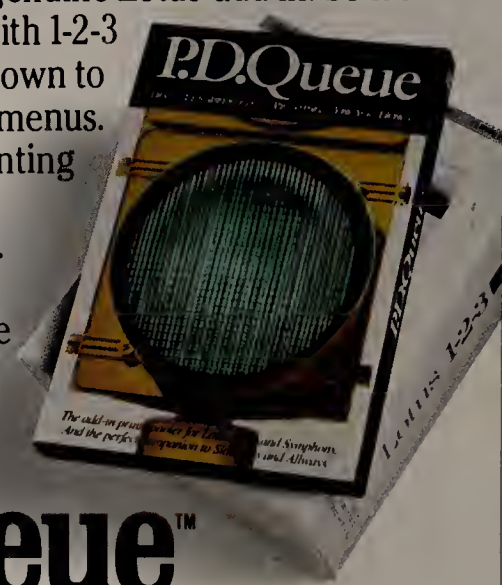

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programming interface make it less appealing than *SQL Server*.

SQLBase Server for OS/2 4.0.1

SQLBase Server is hard to use, poorly documented, and a bit slower than *SQL Server* and *Oracle*. Worst of all, it's buggy.

SQLBase crashed often during *PC World* tests. In an application that used *SQLBase*'s Context Preservation feature to speed repeat queries, the server crashed when two users attempted to lock the same record. In that case we were able to recover the data, and Gupta provided a work-around to avoid a recurrence. But when we set the transaction log file to a specific size and issued a rollback command, and again when we accidentally relocated *SQLBase*'s transaction log file without shutting down first, the data base was corrupted beyond recovery. Such serious bugs are unfortunate in a program intended for critical applications.

SQLBase has the least third-party support of the servers reviewed; at this writing, you can access *SQLBase* with either *1-2-3* or *Excel* using third-party utilities resold by Gupta. In any case, *SQLBase*'s lack of foreign-key data integrity limits its usefulness in environments with a variety of front ends.

SQLBase works with all major network operating systems, including NetWare, *LAN Manager*, Banyan VINES, and any NETBIOS-based LAN. Gupta sells a gateway to allow access to IBM DB2 mainframe data bases and has announced a gateway to Oracle servers.

Installation is complicated by the scattering of instructions through several sets of release notes, and one small but essential piece of information had to be obtained from the company's phone support staff. RAM requirements are surprisingly light: only 4MB, plus 3K for each logged-in user.

There's one crucial feature missing from *SQLBase*'s administrative tools. You can't assign users to groups for efficient management, so access rights have to be laboriously set for each user.

Gupta offers programmers a good selection of tools for both C programming and building screens with *Windows*. It's the only product reviewed that lets you delete a column—good for modifying tables rather than rebuilding them from scratch. *SQLBase* can store SQL code on the server, but unlike with *SQL Server*, you can't create server-based subroutines.

The bugs we encountered during testing are sufficient reason to avoid *SQLBase*. On top of that, it's hard to administer, referential integrity is limited, and the major third-party players have yet to get behind it. It's the least attractive choice of the four servers reviewed.

SQL Server 1.0

SQL Server is the fastest, most powerful, easiest to use, and most flexible of the four servers. Its superior data security features make it the best at juggling a mix of front ends. It also has the strongest support from third-party front-end developers.

SQL Server can communicate not only with *LAN Manager* but with any other OS/2 program, which should help developers create new work-group software. *SQL Server* is also compatible with NetWare and can run data bases developed on Sybase's minicomputer data base systems with little or no recoding.

Like *Oracle*, *SQL Server* requires 8MB of RAM—but its small 42K requirement for each logged-in workstation means it's clearly capable of handling many more simultaneous users than Database Manager or *Oracle*. The only network installation tips in the manual relate to *LAN Manager*; NetWare users have to fend for themselves.

You can administer *SQL Server* from the server or from any DOS or OS/2 workstation. The administrator can create and manage user groups, back up and restore data bases and log files, modify the system configuration, and build and test server-based subroutines. A library of 53 useful subroutines is included with the product.

SQL Server offers administrators several attractive advantages. You can back up a data base without shutting the server down, and data base files are automatically compressed as rows are deleted. Real-time monitoring tools to view system, user, and data base activity aren't as thorough as *Oracle*'s (though they're much easier to understand). Though *SQL Server* lacks built-

POWER TIP NO. 135

Norton MCI From Anywhere

Norton Commander 3.0 users can write MCI Mail with any word processor, as long as the letter starts with the following:
Via: 1
To: *MCI mailbox*
Subject: *subject*
After the letter is complete, save it as an ASCII file in *Commander*'s OUT directory, and it will be sent out the next time *Commander* logs on to MCI. If you wish to attach a binary file, insert the line **Attach:** *drive:\path\filename* between the 'To' and 'Subject' lines.

Lincoln Spector
Assistant Editor

in auditing tools, programmers can write server-based subroutines to log data base and user activity.

The other servers can't match *SQL Server*'s data integrity features. You can build in both foreign-key referential integrity and, unique among the products reviewed, *business rules.* For example, you can prevent a user from deleting a customer record when the customer has open invoices. This type of control helps keep security from being compromised when users with SQL versions of spreadsheets or data bases access the data base.

SQL Server was the overall top performer in *PC World* tests. The scores reflect a significant improvement gained by limiting the server to a maximum of 26 user connections, the number actually required for the tests.

The product's server-based subroutines make it the most powerful tool for professional developers. Since it can be programmed in BASIC and includes a thorough tutorial, *SQL Server* is the only product that could conceivably be programmed by a nonprofessional.

SQL Server's simplicity of operation, superior data security, powerful programming options, and good overall performance bring it closest to fulfilling the SQL server promise. Add to this the flurry of third-party development, and *SQL Server* is by far the best bet among the products reviewed.

Ready to Serve?

Even *SQL Server,* clearly the top product in the roundup, has a way to go before setup will be anything less than a hair-raising adventure. Originally, Ashton-Tate and Microsoft teamed up to create a solution that combined both *SQL Server* and a SQL version of *dBASE IV.* With that front end on indefinite hold, however, developing data base applications with *SQL Server* is more like coding a mini or mainframe data base than setting up a custom PC front end.

Whether or not you want to wait until front ends make banging out SQL code unnecessary, the promise of SQL data base server technology is real. Once all the pieces are in place, the combination of mainframe power and PC flexibility will make SQL servers the data management solution of choice.

Tyler Band is a data base consultant for Vanguard Business Solutions in Sausalito, California. Roberta Furger is an associate editor and Lincoln Spector an assistant editor for PC World.

POWER TIP NO. 140

Easy On-Line Reminders

If you can't always remember short but complex procedures and command sequences (printer setup codes and the like), jog your memory with brief, on-line ASCII how-to files created with your editor or word processor. Format the files so that they're easily readable in a single screen. Give them names you'll have no trouble remembering, and store them in a directory called C:\HELP. Then add a batch file called HELP.BAT, which contains the line **type c:\help\%1**, to your batch file directory, which should be in the PATH statement in your AUTOEXEC.BAT file. When you need assistance, use the DOS command **help** *filename* to get an instant refresher course.

Wanda Smith
Rockville, Maryland

WHERE TO BUY

IBM OS/2 Extended Edition 1.2's Database Manager
IBM
Old Orchard Rd.
Armonk, NY 10504
800/426-2468
LIST PRICE: first copy $830, each additional one $620; set of Database Manager manuals $222
REQUIREMENTS: 8.4MB RAM, plus 1.1MB per data base and 150K per user; 20MB disk space
TECHNICAL SUPPORT: toll-free number, M–F 7–7 ($360 per user per year) or 24 hours, 7 days a week ($384)
OTHER SUPPORT: newsletter, videotapes, training
Reader service no. 665

Oracle Server for OS/2 1.0
Oracle Corp.
500 Oracle Pkwy.
Redwood Shores, CA 94065
800/345-3267
LIST PRICE: $3699; Oracle Tools for OS/2 $799; CASE for OS/2 $9999
REQUIREMENTS: OS/2 1.1 or later version, 8MB RAM, plus 250K–512K per user; 20MB disk space
TECHNICAL SUPPORT: 30 days free, $1000 per year thereafter; toll-free number, 24 hours, 7 days a week
OTHER SUPPORT: newsletter, CompuServe, training, upgrade subscriptions
Reader service no. 666

SQLBase Server for OS/2 4.0.1
Gupta Technologies, Inc.
1040 Marsh Rd.
Menlo Park, CA 94025
800/876-3267, 415/321-5471 (fax)
LIST PRICE: $2495; Excel and 1-2-3 add-ins $295 each; C tool kit $495; Windows tool kit $1295, run-time licenses $150–$300; COBOL tool kit $995; DB2 gateways $30,000–$50,000 each
REQUIREMENTS: OS/2 1.0 or later version; 4MB RAM, plus 3K per user; 10MB disk space
TECHNICAL SUPPORT: toll number, M–F 6–6
OTHER SUPPORT: BBS, newsletter, training
Reader service no. 667

SQL Server 1.0
Microsoft Corp.
One Microsoft Way
Redmond, WA 98052-6399
206/882-8080
LIST PRICE: $2495
REQUIREMENTS: OS/2 1.0 or later version; 8MB RAM, plus 42K per user; 30MB disk space
TECHNICAL SUPPORT: toll number, M–F 7–5
OTHER SUPPORT: BBS, magazine, user group, CompuServe, training
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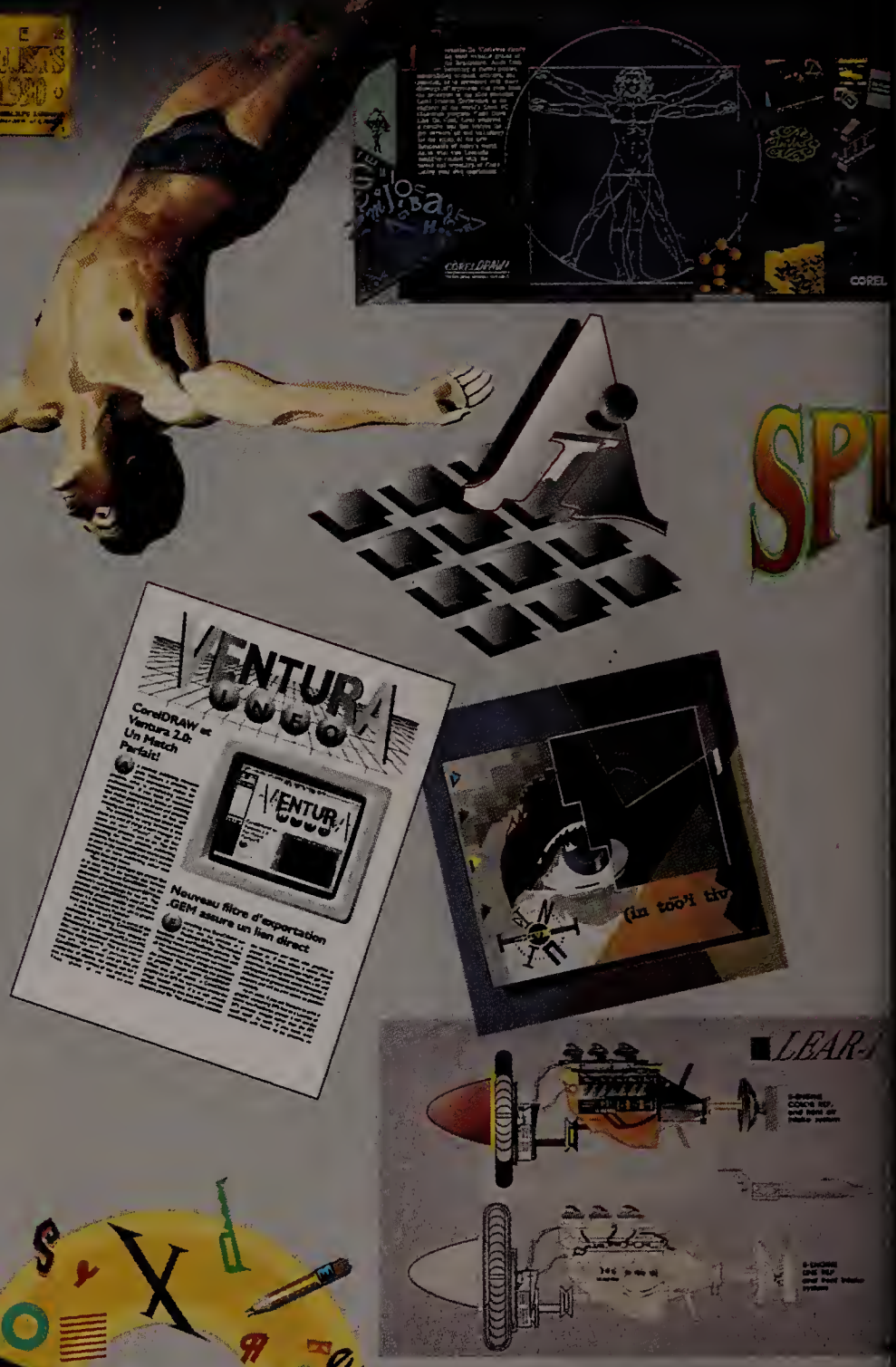

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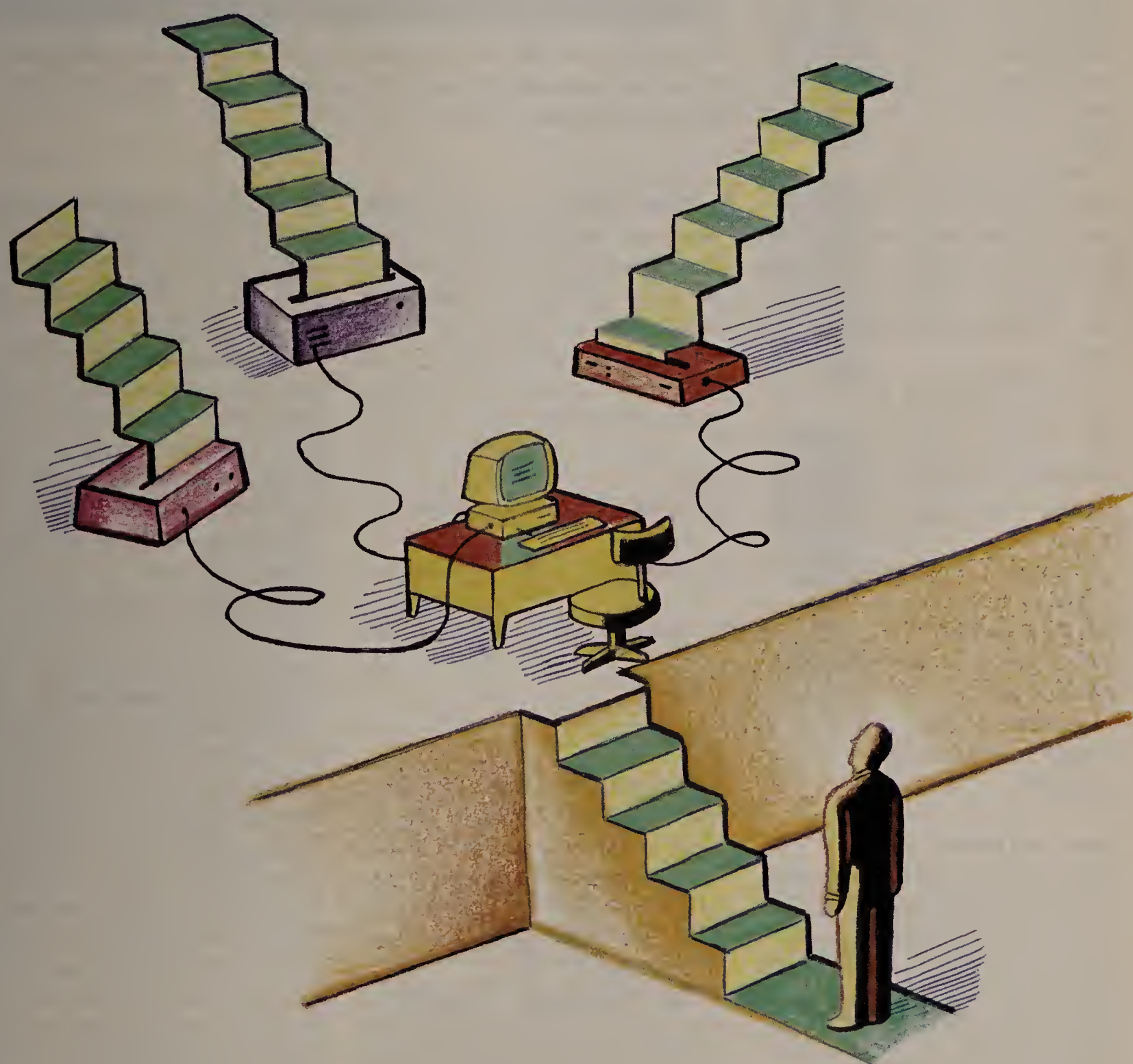
Circle 48 on reader service

Printer Power: NetWare Pop-Up Utilities

Do you need to serve an entire network with a handful of printers? These simple utilities can help. But only Best Buy LANSpool does it without taking a big bite of precious RAM.

David M. Syme



DAVID SUTER

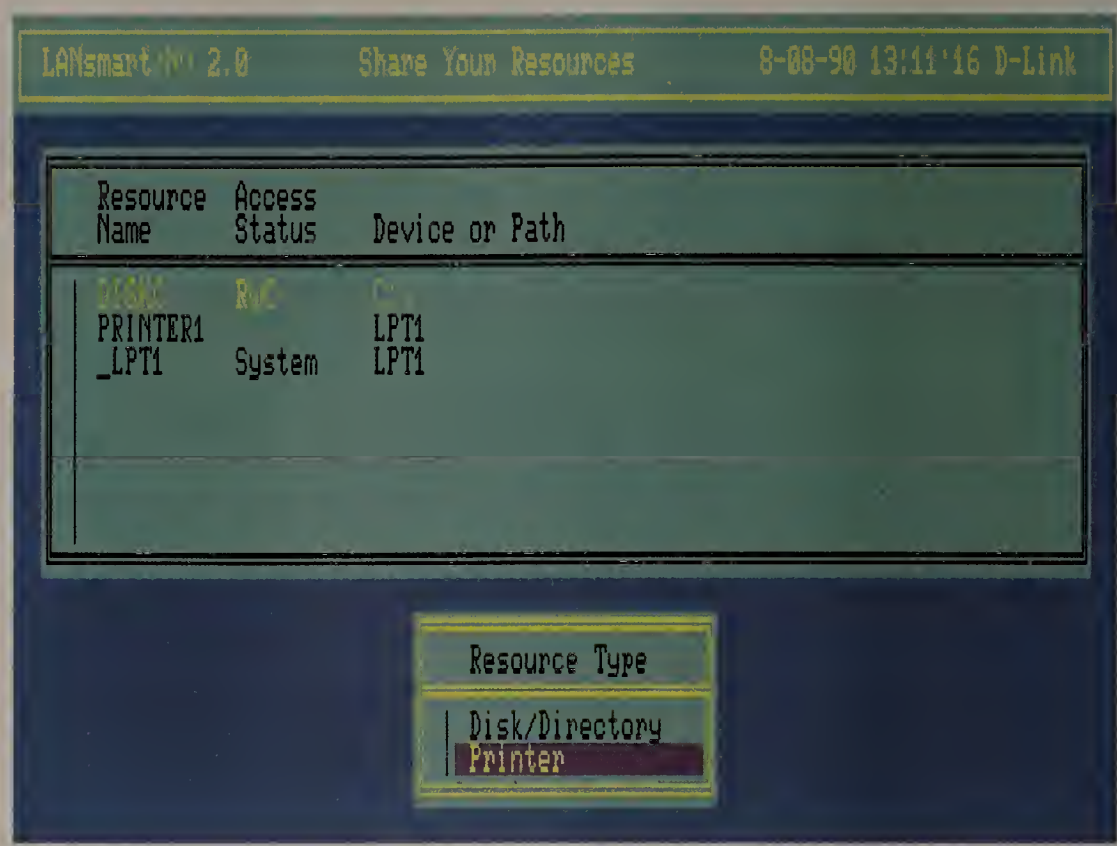
With the latest versions of Novell's NetWare, printing on a LAN has never been easier. You can check on the progress of your print job, switch network printers, delete jobs from the print queue, access special fonts and print effects, and much more.

The new utilities that come with NetWare even provide peer-to-peer printer sharing, which means that you no longer have to tie a printer to the server or waste a PC as a dedicated print server—instead you can send jobs to any networked PC with a printer attached. And with peer-to-peer printing, you can pick up your print job (or clear a paper jam) by stepping across the aisle to the printer at your neighbor's desk rather than hiking down the hall (see the sidebar "Print Server: NetWare 286 Provides Peer-to-Peer Printer Sharing at Last").

Unfortunately, NetWare's printer utilities lack a critical feature: They aren't RAM resident. That means if you need to switch printers or reconfigure the one you're using, you have to exit your application to load the appropriate utility.

Nor is that the only problem. NetWare 2.15's print utilities are slow, and they're tough to install. And NetWare users with versions older than 2.15 must upgrade to get peer-to-peer printer power.

Fortunately, a growing number of third-party vendors are providing reliable RAM-resident, NetWare-compatible utilities that let you perform most important printer-related tasks quickly and easily from within applications—and give you peer-to-peer printer sharing as well.



LANsmart/NV is more than just a printer utility: It's a peer-to-peer network operating system that lets you share files as well as printers. As this screen shows, you use a simple point-and-shoot menu to select resources to be shared.

Share and Share Alike

All the products reviewed here deliver peer-to-peer printer sharing. With that as a given, the key buying issues become printer control features and queue management. Other important considerations include RAM consumption, price, ease of use, and performance.

Printer Control All these utilities can be set up in memory-resident mode so that you can select printers, configure them, and print to them from within applications. Key capabilities include notification that a print job is done and the abilities to change printers and to send a message asking the user at the local print station to change the paper in the printer. Only *LANSpool* and *PS-Print* have all these features. The ability to change print characteristics (like formfeeds or banners) on a job-by-job basis from within applications is also highly desirable.

All these packages let you manipulate jobs from within an application—a critical ability.

Queue Management The ability to view and manipulate print jobs from within an application is critical, and all these packages provide it. It's important to be able to delete jobs, reorder jobs in the queue, and hold jobs for later printing; only *LANSpool* and *PS-Print* can handle all three.

RAM Consumption Since most LAN workstations start off with at least some RAM tied up in network drivers and shells, low RAM consumption is essential for a memory-resident printer utility. Merely setting up your PC as a nonprinting workstation (so you can print on remote printers) can cost between 4K and 160K; if you want to make your PC a print station (so your printer is available to the network), you can expect to sacrifice anywhere from 6K to 191K of PC memory. Since RAM-hungry utilities may keep you from running powerful applications such as *Ventura* or even large spreadsheets, the smaller the utility's appetite for memory, the better.

Ease of Use All these utilities can be installed by menu-driven routines, but those routines vary quite a bit. For instance, *LANSpool* requires that you bring down the LAN before installation, and *Printer Assist* requires a two-byte patch to NetWare to be fully functional.

Performance Printer utilities have little effect on actual print speed, but since printing occurs in the background, they can disrupt normal PC operations. Hence, "good performance" in this context means minimal slowdown of normal computing operations while someone else is using the printer that is attached to your computer. We did informal tests to compare performance degradation caused by these products on print station PCs, and we found that although the level varies, disruption is seldom severe.

LANsmart/NV 2.0

LANsmart/NV provides peer-to-peer file sharing along with printer sharing—the only program reviewed here to do so. This capability adds virtually all the peer-to-peer features of a network operating system like *TOPS* to NetWare's already powerful talents. Unfortunately, *LANsmart*'s $595 price is the highest in the roundup, its other powers are severely limited, the RAM overhead is steep, and it's the only product that won't operate across network bridges.

Printer control is one of the program's weakest areas. You can switch printers from within an application, but that's about it. *LANsmart* cannot tell you your file was printed or send messages to users at local print stations instructing them to change paper trays. Nor does it provide RAM-resident printer configuration.

LANsmart/NV includes a pop-up queue manager, but it's fairly limited. You can delete print jobs and move one job to the top of the list, but that's all. Moreover, *LANsmart/NV*'s memory problems are the worst in the roundup. You must give up 59K merely to access shared printers; add pop-up queue control, and you lose a total of 160K. Setting up your PC as a print station consumes 90K; add the pop-up menus and a primitive E-mail mode, and you'll sacrifice a humongous 191K. (You can save RAM, though, by loading some components in extended or expanded memory.)

Nor is this product easy to set up. Menu-driven installation may be quite confusing if you're not familiar with NetWare basics—and the documentation won't be much help for a novice. Fortunately, things ease up once the system is installed: Well-designed menus and clear, context-sensitive online help make daily use a snap.

On the bright side, *LANsmart/NV* hardly degrades PC performance at all; as long as the print station has a hard disk (for print spooling), slowdown dur-

FEATURES EVALUATION

LANSpool: A Powerful Pop-Up

LANSpool wins the Best Buy among NetWare print utilities, thanks to outstanding print controls and queue management features, plus amazingly low RAM overhead.

● Yes
○ No

	LANSmart/NV2.0	LANSpool 2.0	PS-Print 2,3	Q Assist 4.0, Printer Assist 3.0
Standard features				
List price per server	$595	$395	$395	$328[1]
Compatibility				
ELS I (2.0o)	○	●	○	●
ELS II (2.1x)	●	●	●	●
NetWare 2.0o	○	●	○	●
NetWore 2.1x	●	●	●	●
NetWore 3.x	●	●	○	●
LAN bridges	○	●	●	●
Printer configuration and control				
Chonge print server	●	●	●	●
Print configurotion	○	●	●	●
Predefined print forms	○	●	●	○
Print form modificotion	○	●	●	○
Verifies successful print	○	●	●	○
Requests print operotor to chonge paper	○	●	●	○
Usoge log	○	●	○	●
Queue management				
Delete job	●	●	●	●
Move job to top of list	●	●	●	○
Reorder jobs	○	●	●	○
Hold ond releose job	●	●	●	○
Predetermined releose time	○	●	○	○
Priority print queues	○	●	●	●
RAM consumption				
Printer stotion[2]	191K	6K	57.5K	24K
Workstation[2]	160K	4K	25K	19K
		BEST BUY		

[1] Combined price; Printer Assist is $179, Q Assist $149.
[2] Assumes full feature set is installed.

ing print jobs is almost unnoticeable. If the print station can spool to a RAM disk, the slowdown is imperceptible.

Nonetheless, *LANsmart/NV* is simply too expensive, RAM hungry, and feature poor for most users. It makes sense only if you must have peer-to-peer file sharing.

LANSpool 2.0

At $395, LANSystems' *LANSpool 2.0*, *PC World*'s Best Buy, is quite reasonably priced. Better yet, it offers superb printer control and queue management. Best of all, it does everything in a tiny amount of RAM.

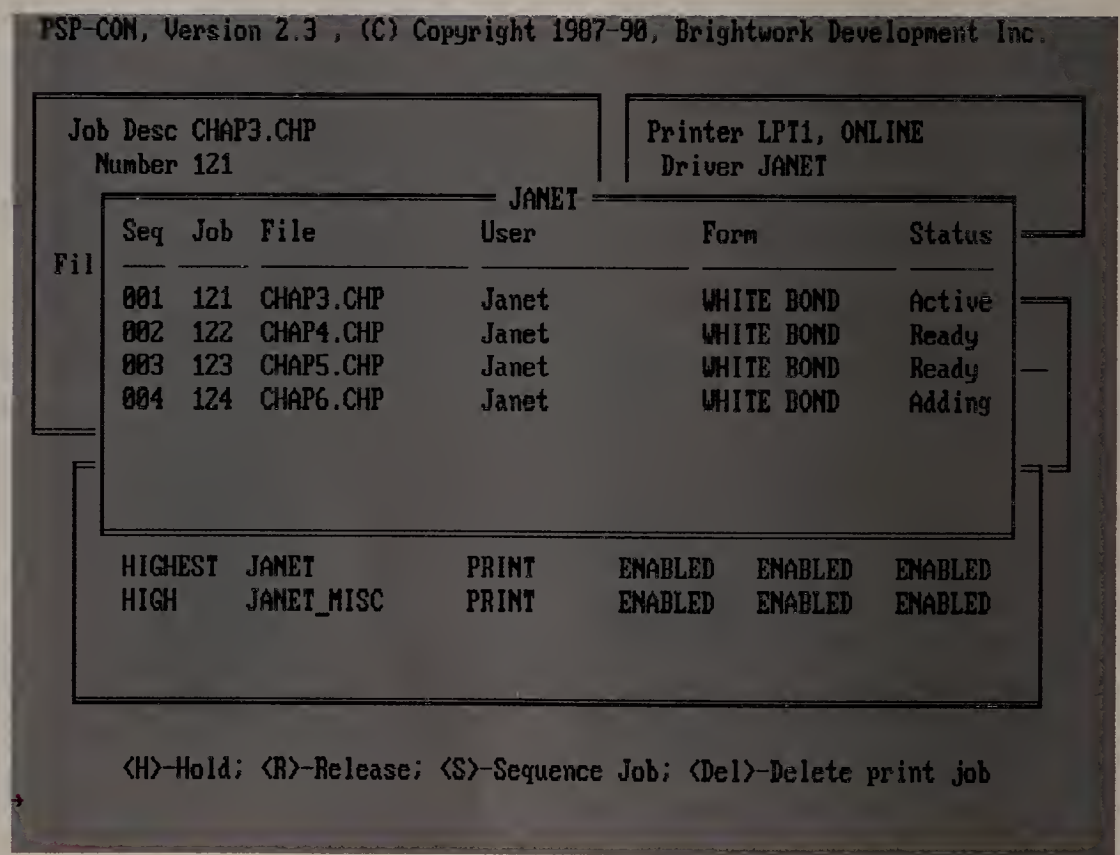
LANSpool delivers printer control via pop-up access to NetWare's unsurpassed utilities, Printcon and Printdef. In addition, *LANSpool* sends you a message when a job is done printing and lets you notify a print operator to swap paper trays by sending automatic pop-up screen messages for various kinds of print jobs.

LANSpool offers superb printer control and queue management.

Similarly, you get full-featured RAM-resident queue management via a pop-up window to NetWare's Pconsole. *LANSpool* adds a proprietary utility called Status that lets you know whether the printer is on line, printing, or holding jobs. And unlike NetWare Print Server, Status lets you check on the printer before the job is sent instead of afterward.

LANSpool boasts the lowest memory use of the roundup. Workstations sacrifice no RAM at all for access to peer-to-peer printing and lose only 4K if they load pop-up TSRs. The print station module takes up a mere 2K (6K if you want pop-up utilities).

LANSystems' LANSpool, PC World's Best Buy, gives you access to NetWare's own queue and printer control utilities, but popped up in a window so you needn't leave your application to use them. Here, LANSpool's own menu lets you choose a print server.



Brightwork's PS-Print has excellent pop-up queue and printer control. The queue-handling screen shown permits print jobs to be held, released, deleted, and moved higher or lower in the queue.

LANSpool also delivers excellent performance; little degradation occurs on print stations.

Installing *LANSpool* is painless; the only problem is that you have to turn off the net to do it. Using it is just as easy. Its interface is not only powerful, it's elegant. A pop-up window lets you choose between LANPrint, Pconsole, and Status, and it provides access to Novell's own on-line help. Documenta-

tion is step-by-step specific.

LANSpool 2.0 is a real standout, thanks to its low RAM use, outstanding printer control, full-featured queue management, and reasonable price. If you're in the market for a network print manager, you can't do better than this.

PS-Print 2.3

Brightwork's *PS-Print* ($395) comes with *Queue-It,* a pop-up utility that allows users to choose different network printers and access font and paper controls via NetWare's Capture command —all from within applications.

Printer control is excellent: All important features are supported, including verification of completed print jobs. Not only can you set up *PS-Print* to notify the user at the print station to change settings, paper, and so on; if he or she doesn't jump to it within 10 seconds, you'll be notified so you can hold the print job.

Queue management is excellent too; this utility boasts a menu-driven interface and a full-featured set of queue controls that are roughly as powerful as those of NetWare's Pconsole. The only fly in the ointment is that your system must be set up as a print station before you can access the queue controls.

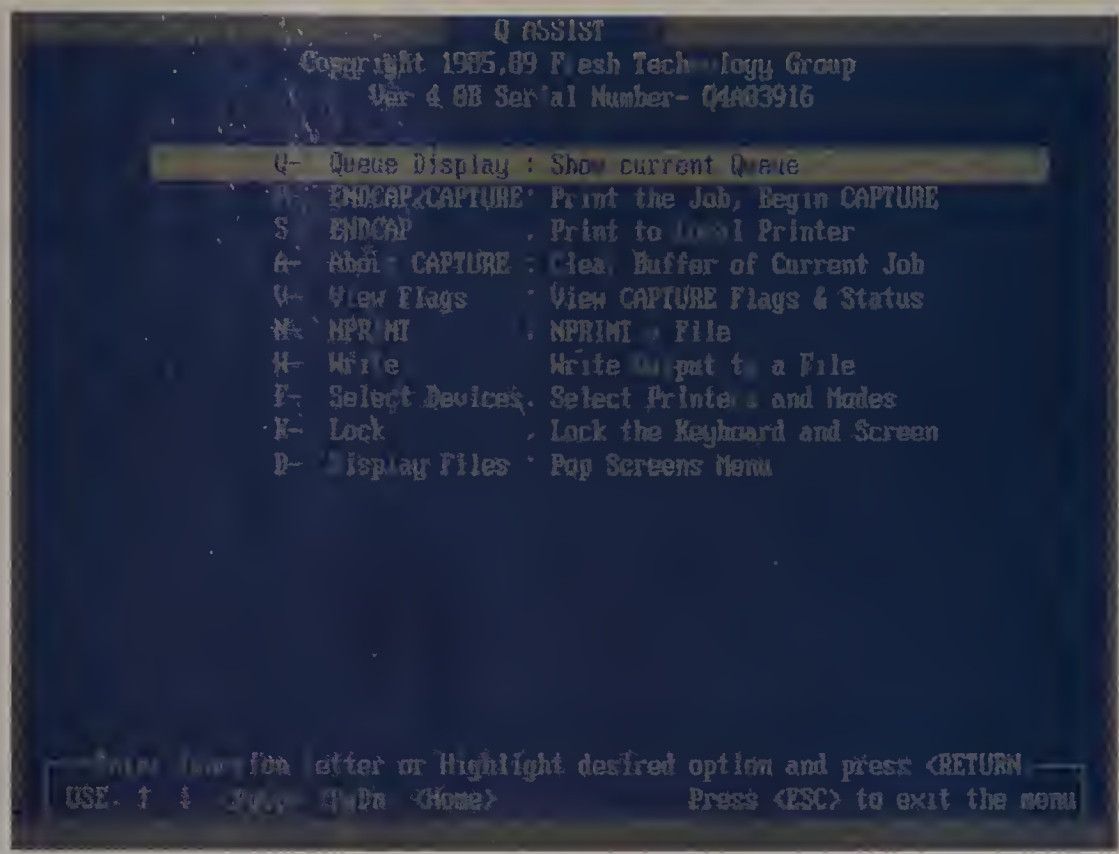
RAM usage isn't exorbitant, but it's not insignificant either. Workstations must devote between 12K and 25K to accessing remote printers; to make your PC a print station (and gain RAM-resident queue management capability), you'll have to give up 57K of perfectly good RAM.

PS-Print is fairly easy to install and use. There's no on-screen help, but most of its menu-driven operations are so straightforward you may not miss it. And the documentation is quite good.

PS-Print's performance is adequate but somewhat inferior to *LANsmart*'s and *LANSpool*'s. If your PC is set up as a print station you may notice a slowdown in performance during heavy print traffic or when someone is printing graphics.

PS-Print's strong printer controls, easy installation, and reasonable RAM usage are attractive features. However, the program's merely adequate performance and restricted access to RAM-resident queue management will probably send smart buyers elsewhere.

A new version of *PS-Print,* 3.1, was released as we went to press. It includes many handy new features, supports *NetWare 386,* and (best of all) uses less memory in print server mode—34K in-



Among other things, Q Assist's pop-up menu lets you select printers and display the jobs in the print queue—but you can't change the order of the jobs in the queue.

PRINT SERVER: NETWARE 286 PROVIDES PEER-TO-PEER PRINTER SHARING AT LAST

NetWare 386, Novell's new high-end network operating system, caused quite a stir by providing peer-to-peer printer sharing as a standard feature. This feature is also available for 286-based NetWare LANs, thanks to a utility called Print Server that's shipping as part of NetWare 2.15, the latest version.

Print Server takes up only 9K of RAM on print stations (PCs to which a printer is attached) and uses no RAM at all on workstations (networked PCs without printers). And it includes several handy features: For instance, if a network printer is off line, out of paper, or jammed, Print Server will send specified users a screen message giving a detailed description of the problem.

Unfortunately, Print Server's silver lining has a few clouds. For one thing, installation is difficult. For another, the documentation is disk based and lacks an index or a detailed table of contents. And, of course, it's not memory resident, so if users need to change printers, modify queues, or reconfigure printers, they'll have to exit the application they're using. —*D. M. S.*

stead of 57K. However, *PS-Print*'s primary problem, restricted queue access, remains unaddressed.

Q Assist 4.0 and Printer Assist 3.0

Together (for a combined price of $328), *Q Assist* and *Printer Assist* provide many useful network printing features, use very little RAM, and are the only utilities reviewed that work with NetWare ELS I version 2.0a and NetWare 2.0a. However, their printer control and queue management features are limited, and printer configuration is a lot less friendly than with other products.

Printer Assist makes reports on printer usage and gives you the handy ability to assign priorities to print jobs so longer ones go last. However, a number of key control features are not supported, including notification of print completion and automatic messages to print operators.

Q Assist is the pop-up queue manager. Its easy-to-use interface is much like Pconsole's, but its functionality doesn't come close. For example, you can't change the order of print jobs in the queue, and you can't hold a job for printing at a later time.

Printer Assist's appetite for RAM is quite low: It uses no RAM at all on workstations and only 5K on print stations. *Q Assist* is similarly restrained in its RAM use—only 19K per workstation or print station.

Installation routines may be too difficult for nontechies: For *Printer Assist*, you have to patch NetWare to give local users the right to delete other users' files from the local print queue. Nor does ease of use improve significantly once installation is complete. *Printer Assist*'s printer setup and configuration manager is surprisingly clumsy. Instead of selecting predefined printer control codes from a menu, users must enter Escape sequences from scratch—a tedious and confusing task.

And there's more bad news. If you're using an EGA or VGA display in graphics mode (as with *Windows*), popping up and then unpopping *Q Assist*'s control menu can result in an unreadable screen. Given the growing interest in Microsoft's recent release of *Windows 3.0*, this is a serious problem.

Printer Assist's performance is acceptable; the PC print station slows down only slightly when graphics are being printed.

Printer Assist and *Q Assist* are easy on RAM, but their lack of key features

EXECUTIVE SUMMARY

Easy Access to Network Printers

Third-party, NetWare-compatible printing utilities provide power that NetWare's own utilities lack.

NetWare 286 didn't win its popularity on the strength of its command-line printing utilities. These third-party NetWare-compatible products not only add peer-to-peer printer sharing but let you access network printers and print queues from inside your applications via pop-up windows.

LANSystems' **LANSpool** earns a Best Buy thanks to its superb printer controls, low RAM consumption, reasonable price, and outstanding ease of use. D-Link Systems' **LANsmart/NV** provides peer-to-peer file sharing—but its $595 list price is a lot steeper than the competition's.

	LANsmart/NV 2.0	LANSpool 2.0	PS-Print 2.3	Q Assist 4.0/ Printer Assist 3.0
Printer control	Poor	Excellent	Excellent	Fair
Queue management	Good	Excellent	Excellent	Fair
RAM consumption	Poor	Excellent	Fair	Good
Ease of use	Poor	Excellent	Good	Poor
Performance	Excellent	Excellent	Good	Good
Overall value	Fair	Excellent	Good	Fair
		BEST BUY		
Reader service no.	605	606	607	608

How we rate NetWare printer utilities Since all these printer utilities provide peer-to-peer printer sharing, the most important features to look for are powerful printer control capabilities, flexible queue management, and low RAM consumption. Other handy features include good performance (that is, minimal disruption of normal computing operations while your PC is functioning as a print station) and easy access to these features via simple pop-up menus.

Printer control includes the ability to change printers, configure them, and control them. In order to be rated Excellent, a utility must provide pop-up printer selection and pop-up notification when a print job is complete and when the user at the local printer should change paper.

Queue management refers to the ability to view and manipulate jobs in the queue from within an application. A rating of Excellent is awarded only if the utility lets an authorized user delete files from the queue, reorder jobs, and hold jobs for later printing.

RAM consumption refers to the amount of RAM these utilities use in print station mode (which requires more RAM than workstation mode). A utility must consume 15K or less in print station mode to be rated Excellent.

Ease of use concerns both installation and daily use. For an Excellent rating, we require menu-driven installation; clear, context-sensitive on-screen help; step-by-step ("type this and you'll see that") documentation; and an intuitive menu-driven interface.

Performance refers to the slowdown you'll experience doing work if your PC is set up as a print station and someone else is accessing your printer. This assessment is based on informal tests, which revealed that even at the worst, slowdown is negligible.

Overall value combines the above criteria, plus price.

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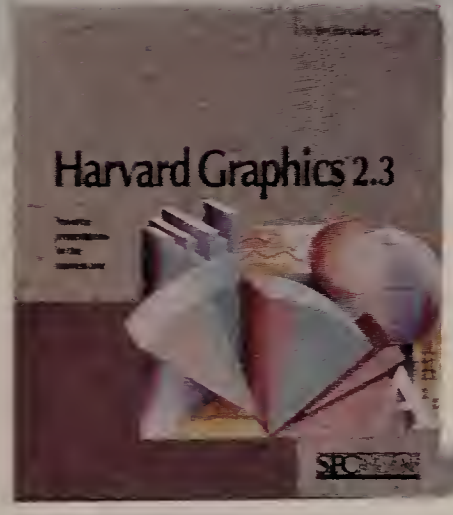

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NETWORK PRINTING BASICS: HOW NETWARE MINDS PCs AND QUEUES

If you have only one network printer on your NetWore LAN, printing is foirly stroightforword. You set up your opplication to print to your PC's defoult port (usually LPT1:), ond NetWare redirects the print job to o holding areo on the server's hord disk called o print queue. There it woits its turn with other print jobs until it prints out on the network printer.

When you add more network printers, however, printing con get o lot more complicoted in o hurry. You'll probobly hove multiple print queues, ond users will need to route print jobs to the right queue. This is o tosk few softwore applicotions can handle by themselves. NetWore provides the Copture command so users con do this job, as well os set parameters like formfeeds, bonner poges, and so on. This system works very well —but you hove to get to the DOS commond line to issue o Copture commond.

NetWore olso provides three more commond-line utilities. Printdef ond Printcon let you choose vorious Copture options ond sove those settings. In oddition, these hondy utilities ollow users to select o driver from Novell's list of 30 printers and modify it to use vorious combinotions of fonts and poper sizes—all by making selections from o menu.

Print Server, NetWare's newest print utility, provides peer-to-peer printer shoring, allowing users to choose o printer ottoched to ony networked PC, not just printers ottached to the server (see the sidebor "Print Server: NetWore 286 Provides Peer-to-Peer Printer Shoring at Last").

Once you've chosen your printer ond print queue, you'll still need to modify thot queue now ond then—either to delete o print job (thot 100-page onnual report, for instonce, thot you've sent in error), move your print job to the top of the queue, or check to see how mony jobs ore oheod of yours. To do this, you'll use NetWore's Pconsole utility. Like all its brothers, it's eosy to use—but it must be started from the command line.

For the most port, NetWore's print utilities ore well designed and rich in features. However, the fact that they con't be used from within on opplicotion (os pop-up TSRs) is o mojor drowbock. This is why many users are turning to third-porty pop-up utilities. —*D. M. S.*

(not to mention erratic graphics compatibility) and their clumsy printer manager knock them out of the running.

Pop Up and Get Down

LAN printing utilities have to cover a lot of territory, so it's a treat to discover a program like Best Buy *LANSpool* that succeeds so well in covering all the bases—full-featured pop-up printer control and queue management, good performance, low RAM consumption—at a relatively low price. Until Novell adds RAM residence (plus better speed, easier installation, better documentation, and greater reliability) to NetWare printer utilities, this well-designed utility from LANSystems will constitute the state of the art.

David M. Syme is a LAN consultant with Marathon Micro, an Alamo, California, network consulting firm.

For more information about all products in this article, circle reader service no. 901.

WHERE TO BUY

LANsmart/NV 2.0
D-Link Systems, Inc.
5 Musick
Irvine, CA 92718
714/455-1688,
714/455-2521 (fax)
LIST PRICE: $595 per server
REQUIREMENTS: 640K; one floppy drive (hard drive for each print server); DOS 3.1 or later version; NetWare 2.1x, 3.x, or ELS II 2.1x
TECHNICAL SUPPORT: toll number, M–F 8–5
OTHER SUPPORT: company BBS
Reader service no. 605

LANSpool 2.0
LANSystems Inc.
300 Park Ave. S
New York, NY 10010
800/458-5267,
212/995-8604 (fax)
LIST PRICE: $395 per server
REQUIREMENTS: 384K; one floppy drive; DOS 3.0 or later; NetWare 2.1x, 3.x, or ELS II 2.1x
TECHNICAL SUPPORT: toll-free number, M–F 9–7:30
OTHER SUPPORT: none
Reader service no. 606

PS-Print 2.3
Brightwork Development
766 Shrewsbury Ave.
Tinton Falls, NJ 07724
800/552-9876,
201/530-0622 (fax)
LIST PRICE: $395 per server
REQUIREMENTS: 384K, one floppy drive, DOS 3.1 or later version, NetWare 2.1x or ELS II 2.1x
TECHNICAL SUPPORT: toll number, M–F 9–7
OTHER SUPPORT: newsletter
Reader service no. 607

Q Assist 4.0, Printer Assist 3.0
Fresh Technology Group
1478 North Tech Blvd. #101
Gilbert, AZ 85234
602/497-4200,
602/497-4242 (fax)
LIST PRICE: Printer Assist $179 per server, Q Assist $149 per server
REQUIREMENTS: 384K, DOS 2.0 or later version, NetWare 2.0 or later version
TECHNICAL SUPPORT: toll number, M–F 8–5
OTHER SUPPORT: none
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VGA-Mono	$609	$679	$819	$929	$1428
VGA-Color	$860	$930	$1070	$1180	$1679
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SVGA-Color*	$1010	$1150	$1260	$1759	$2360	$3150
Portable VGA	$2640	NA	$2890	$3389	NA	NA

* SVGA 1024 x 768 interlaced

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VGA-Mono	$819	$929	$1428	$2029	$2819
VGA-Color	$1070	$1180	$1679	$2280	$3070
SVGA-Color*	$1150	$1260	$1759	$2360	$3150

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Mono	$520	$660	$770	$1269	$1870	$2660
VGA-Mono	$679	$819	$929	$1428	$2029	$2819
VGA-Color	$930	$1070	$1180	$1679	$2280	$3070
SVGA-Color*	$1010	$1150	$1260	$1759	$2360	$3150
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Circle 198 on reader service card

†TRW-National Computer Maintenance Services-Free on site service for 386/SX, 386/DX, and 486's for customers located within a 100 mile radius of any of over 200 TRW service centers. On site service for 286's available et extra cost. Call for details

Peripherals & Software

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1381 14" Diamond Scan (to 800x600) $499
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3D 14" SVGA/EGA (1024x768i) 649
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5D 20" SVGA/EGA (1280x1024) 2350
Panasonic
C1391 PanaSync (to 800x600) $489
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Max15 14" Mono (to 1024x768i) $249
UltraSync 14" SVGA/EGA (800x600) 520
UltraSync 16" SVGA/EGA (1024x768i) 879
Princeton Publishing Labs
Multiview 15" Mono DTP w/adapter .. $690
Samsung/Leading Technology
14" VGA Color .31DP (640x480) $369
14" VGA Color .41DP (640x480) 299
14" SVGA Color (to 800x600) 419
Seiko
1440 14" SVGA (1024x768i) $599
Sony
CPD 1304 14" SVGA (to 1024x768) $689
Zenith
ZCM1492 VGA Flatscreen (640x480) $619

Video Cards

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VGA Wonder 256K/512K $245/297
NEC
PC Magazine's Editors Choice
Graphics Engine 16 (1024x768) $679
Graphics Engine 256 (1024x768) 969
Paradise
VGA 1024 with 256K $235
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8514/A Plus 569
VGA Memory Upgrade 199
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1024i VGA with 256K/512K $239/299
VRAM VGA with 512K 469

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IB4 4 Outlet Isobar 45
LC1200 Line Conditioner 159
BC325 Battery Back-up 279
BC450Battery Back-up 349
OMNI450 or 450LAN Battery Back-up .. 419
BC750LAN Battery Back-up 549
OMNI1200 Battery Back-up 795

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1200 Internal with software $49
1200 Ext. ..... 70 2400 Ext. 129
2400 Internal w/software/MNP5 .. 75/129
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Courier HST 14,400 Int./Ext. $579/599
Courier V.32 9600 External 889
Courier Dual Standard External 995

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B244X Dual 5.25 44M External 1995
PC2/50 NonbootableCard 169
PC2B/50 Bootable Card 230
Plus Hardcards
Hardcard 20 8 bit $539
Hardcard 40 8 bit or 16 bit 599
Hardcard 80 16 bit 695
Seagate
20M 65ms ST225 Half Height $209
20M 35ms ST125 Half Height 229
30M 35ms ST138 Half Height 245
40M 28ms ST251-1 Half Height 319
40M 24ms ST151 Half Height 419
80M 28ms ST4096 MFM 590

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VP150I 150MB Internal Novell certified 895
VP150E 150MB External Novell certified . 1175
VP402 Interface Board for VP Series 115
VP409 PS/2 Interface Board for VP Series 230
Maynstream 60MB Portable 889
Maynstream 150MB Portable 1395
Maynstream 2200HS 2.2GB Portable .. 4350
Colorado Memory Systems
DJ-10 Jumbo 40/80MB Internal $249
KE-10 External Chasis Kit with Interface 139
QFA500 ..... Call

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Microsoft
Bookshelf 1.0 $195 Stat Pack $99
Programmer's Library 295
NEC
CDR35 Portable $439
CDR82 Int. ..... 654 CDR72 Ext. 729
XT/AT Interface Kit 149
Clipart 3D ..... 285 Image Folio ... 285
Sony *Kits*
CDU510 Int. .. $665 CDU1701 Ext. $779

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Half Page Scanner $189
Full Page Scanner 499
Hand Scanner 165
Complete OCR Software for HS/Page 235/309
Kurta
IS/One 12X12 ..... $399
IS/One 12X17 655
Microtek
MSF 300G ... $1495 MSF 300Z ..... Call
MSF 400G ..... 2750 MSII 1050
Summasketch II *Digitizers*
12x12 ..... $335 12x18 ..... $599

Input Devices

CalComp WIZ 1000 DPI $175
Pen Option 60
Logitech
Hi-Rez C9 Serial Mouse $85
Hi-Rez C9 Bus Mouse 92
Trackman 320 DPI Serial/Bus 99/109
Microsoft Mice
Serial with Paintbrush 200 DPI $109
Bus Mouse with Paintbrush 105

Printers

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BJ130e 15" .... $695 LBP4 Laser $995
LBP8-III Laser 8PPM 1650
Citizen
GSX 140 ..... $329 GSX 200 ..... Call
Epson
LX810 ..... $179 FX850 ..... $329
FX1050 ..... 439 LQ510 289
LQ850 ..... 495 LQ950 495
LQ1010 ..... 439 LQ1050 669
LQ2550 ..... 899 EPL6000 899
Hewlett Packard
Deskjet Plus .. $710 LaserJet IIP . $1025
Laserjet III ..... 1650 Laserjet IID 2995

Laser Jet Accessories

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HPLJII Postscript cartridge ..... Call
Pacific Data Products
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25 in 1 Cart. for III or IIP 369
Postscript Cart. for III or IIP 375
1M Memory Card for IIP 275
CPI
Superset+ 425 in 1 ..... $295
Jet Memory III or IIP 174
1M Expansion 96

Kodak Diconix
150Plus $330
NEC and **Texas Instruments** ..... Call
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ML320 ..... $345 ML321 ..... $479
ML380 ..... 315 ML390+ 475
ML391+ ..... 655 ML393+ 995
OkiLaser 400 4PPM 1010
Panasonic
1180 ..... $189 1191 ..... $245
1124 ..... 299 1624 429
1695 ..... 415 4420 Laser ..... Call
Logical Connection
256K/512K Print Buffer $449/529

Plotters

CalComp
1023 ..... $3695
1043DM 5700
Houston Instruments (Call for Prices)
DMP52 ..... DMP52MP DMP61
DMP61DL ..... DMP62 ..... DMP62DL
Image Maker
(PC Magazine's Editors Choice) ..... Call

Software for Windows 3.0 Environment

Aldus Pagemaker $499
AMI 129
AMI Pro. 319
Corel Draw V. 1.2 329
Microsoft Windows 3.0 99
Microsoft Excel 2.1 309
Microsoft Word for Windows 325
Precision Software Superbase 2 189
Precision Software Superbase 4 395
HDC Windows Express or Manager 49
Crosstalk for Windows 1.0 129

Novell Networking
(Novell Authorized Sales and Support)

4 User ELS Level I v. 2.12 ..... $519
8 User ELS Level II v. 2.15 1250
Advanced Netware v. 2.15 2150
SFT Netware 286/386 ..... 3350/4550

Networking Hardware

Gateway
G/Ethernet AT $435 for PS/2 ..... $435
G/Ethernet (8 bit) 199
Lantastic
2 MBs Starter Kit/Adapter $409/195
Ethernet Starter Kit/Adapter 545/269
Standard Micro
PS110 Board for PS/2 ..... $395
PC500 16 Bit for WS/Server 260/335
PC550 16 Bit Tw. Pr. for WS/Server ... 291/355
PC270E Twisted Pair 139
PC130 Arcnet Board 117
ARCNET passive/active hubs 72/321
ARCNET intell. hub coax/Tw. pr. . 495/609
Synoptics
505UTP Transceiver $139
1000 Conc./2500 Workgroup Conc. ... 2575/839
Tiara
4 port hubs ..... $49 8 port hubs ... $285
Lancard/A 8 bit ARCNET 89
Lancard/A 16 bit ARCNET Board 249
Lancard/E 8 bit Ethernet 199
Lancard/E 16 bit Ethernet Tw. Pr. 339
Lancard/E 8 bit Twisted Pair 329
Tops
Repeater ..... $135 Flashcard $155
Western Digital *Ethercard+*
8 bit ..... $185 Twisted Pair .. $319
PS/2 ..... 285 /EPB PS/2 285
8 bit with ROM Socket 205
16 bit 255
Xircom *Pocket Adapters*
ARCNET Coax or Tw. Pr. $295
Ethernet Twisted Pair 489

Software

Autodesk Animator $239
Borland Quattro 95 Quattro Pro 329
Caere Omnipage 386 2.1 619
Datastorm ProComm Plus 52
dBase IV ..... 479 Microrim R:Base 489
Delrina Perform 2.0 159
Delta Technology Direct Access 59
Deskview 386 v. 2.2 125
Fifth Generation Fastback Plus 109
Foxbase + ... 189 Harvard Graphics 329
Generic CADD Level 3 205
IBM Displaywrite V NEW! ..... Call
Lotus Freelance Plus 329
Lotus 123 r. 2.2 349 Lotus 123 r. 3.0 409
Microsoft Works 99 Word 5.0 215
Norton Utilities Advanced 95
Paradox v. 3.0 . 445 PC Tools 6.0 95
Peachtree Acctg III w/Data Query . 149/225
Pro. Write ..... 145 QEMM 5.0 65
Quicken ..... 39 Timeslips III 159
Symatec Q&A . 220 Timeline 3.0 379
Timeworks Publish It! 125
Word Perfect 5.1 249
Wordstar 6.0 249
Ventura Publisher 2.0 519

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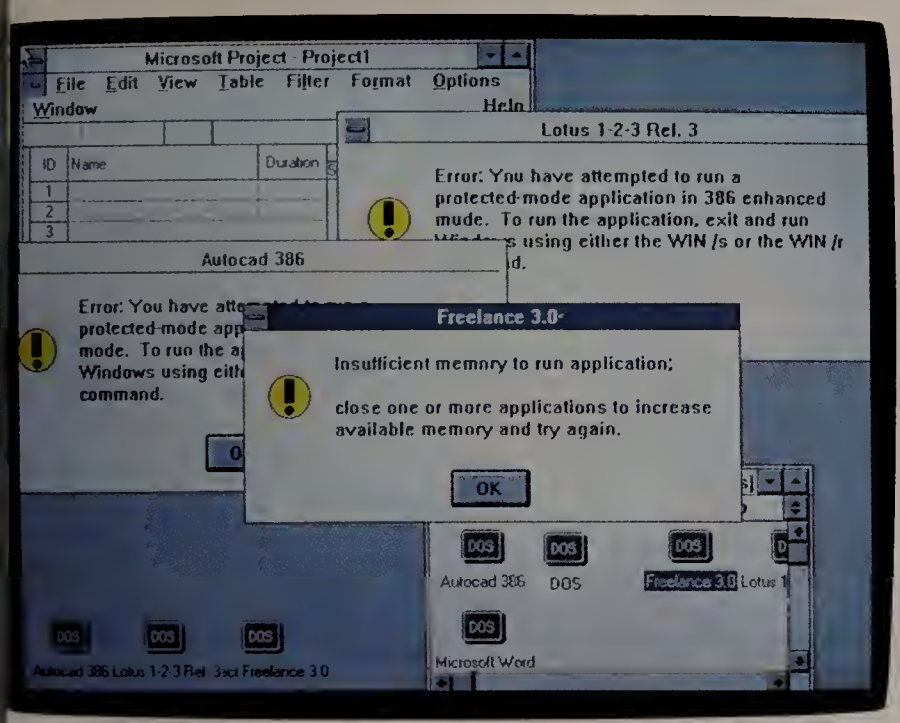
WOR 8-10

Circle 198 on reader service card

Is Windows 3.0 the end of DESQview™?

Not if you're still using DOS programs.



Windows 3.0. The multitasking, windowing environment.

DESQview 386 2.3. The multitasking, windowing environment.

Are you still using MS-DOS programs on your PC?

You may want to use DESQview as your primary operating environment.

The new DESQview 2.3 and DESQview 386 2.3 let you use your favorite DOS and DOS-extended programs in windows side-by-side on 80286, 80386 and i486 PCs. As you can see above, you can even run Windows programs within DESQview 386. So the next time you get error messages like the ones at the left in Windows, remember how the same set of programs look running in DESQview.

Whatever standard you use—DOS, extended DOS or Windows—DESQview is still the best way to get the most out of the hardware and software you own today.

DESQview. The obvious choice.

Quarterdeck

Quarterdeck Office Systems, 150 Pico Boulevard, Santa Monica, CA 90405 (213) 392-9851 Fax: (213) 399-3802

This comparison was made using a system like the one you might run: Both shots show an ALR FlexCache 33/386 running DOS 3.3 with VGA display adaptor, Novell NetWare v3.01 Rev. A, with IPX/SPX v3.01 Rev A, Microsoft Mouse 7.00, and Microsoft SMARTDrive v3.03 disk cache. Buffers were set to 20. For the Windows screen, we ran Microsoft Windows 3 HIMEM.SYS and EMM386.SYS. For the DESQview screen, we ran QEMM 386 v5.1.

Trademarks: Microsoft, Windows, MS-DOS, 80386, i486, ALR, FlexCache, Novell, NetWare. ©1990 Quarterdeck Office Systems

THE READERS' CHOICE

1990

JAVIER ROMERO

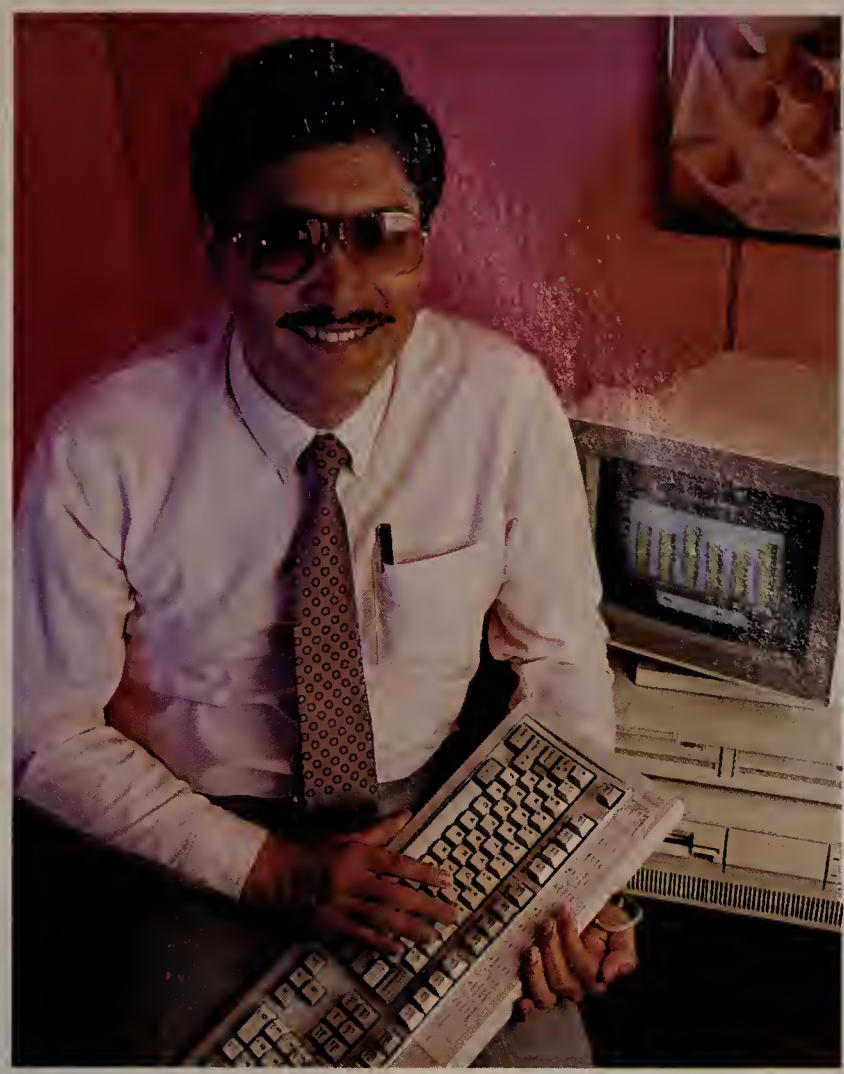
THE WORLD CLASS AWARDS ARE BACK AND BIGGER THAN EVER—WITH MORE CATEGORIES, MORE CLOSE FINISHES, AND THE BIGGEST READER RESPONSE EVER.

WINNING PROFILES

For most of us, the phrase "you may already have won" is merely a cheap marketing ploy, but for three lucky PC World *readers, it's become a reality. Every year we reach into the heap of World Class ballots and randomly select three winners. Our third-prize winner walks away with the most popular laptop computer, while our second-prize recipient takes home the top transportable. The first-prize winner hauls in the jackpot: the premier desktop computer, plus the remaining lineup of World Class hardware and software—a package worth nearly $31,000.*

KEITH CORSBIE

First prize: Compaq Deskpro 386/33, plus the winning hardware and software products
HOME: Miami, Florida
AGE: 38
PROFESSION: Accounting manager for The Wackenhut Corporation, which provides security services for power plants and government installations
HOBBY: Tennis
OFFICE PC: IBM PS/2 Model 70
HOME PC: Kaypro PC XT clone with an NEC MultiSync monitor and an Epson dot matrix printer
CORE PROGRAMS USED: 1-2-3 *release 3,* DisplayWrite, Harvard Graphics, The Norton Utilities
PROFILE: A PC-proficient manager who sits on the corporate committee that makes recommendations for new equipment
QUOTE: "Am I going to have to pay taxes on all this?"



ACEY HARPER

When we want your opinion, we ask for it—and this year your response was earthshaking. Our World Class Awards contest produced more than *30,000* ballots—the biggest landslide in *PC World* history—proving more than ever that our readers are informed, demanding, and not shy about sharing their thoughts.

We asked readers to name their favorite hardware and software products in 37 categories, offering over $40,000 in prizes for three lucky voters (see the sidebar "Winning Profiles"). When we finally dug our way out of the rubble, we uncovered a heap of old favorites and more than a few newcomers. The results appear on the following pages.

In this industry, nothing stands still very long, including the World Class contest. This year we added a handful of important categories, such as top data base utility and best on-line service or BBS. And for the first time we asked readers to name their favorite mail-order firms and the top companies in service and support.

What makes one company soar where another stumbles? Responsiveness, reliability, and technical expertise, say our readers, who voted overwhelmingly for WordPerfect Corporation as the most user-friendly software firm. Among hardware manufacturers the race was virtually a dead heat between IBM and Austin, Texas–based Dell Computer, but IBM won by a nose. When it comes to ordering by mail, our voters

DANIEL TYNAN

MARK LUINENBURG

HOWARD TEGLAND

SECOND PRIZE: Compaq Portable 386
HOME: Pierre, South Dakota
AGE: 64
PROFESSION: Retired; former audiovisual technician for the South Dakota State Library for the Handicapped
HOBBY: Uses his PC to do volunteer work for the Shriners' Circus Club and performs occasionally as clown. "My clown name is GIGO—garbage in, garbage out. It's my own little joke."
HOME PC: AT&T PC 6300 with 30MB hard disk, a Plus HardCard, and an Epson dot matrix printer
CORE PROGRAMS USED: PC-Write, WordStar, Lucid 3D, PFonts
PROFILE: Home PC user
QUOTE: "Last thing I ever won was a fifth of whiskey when they pulled my name out of a hat. That was 20 years ago."

CRAIG GARRETT

THIRD PRIZE: Compaq LTE/286
HOME: Colorado Springs, Colorado
AGE: 42
PROFESSION: Sales manager for Outomec, a mining equipment manufacturer
HOBBIES: Racquetball and computers. "I enjoy messing around with computers, setting up customized data bases, that sort of thing."
OFFICE PC: Zenith TurbosPort 386
HOME PC: Stanford Computers XT with an Epson LQ-2500 printer
CORE PROGRAMS USED: Informix's SmartWare, WordStar 2000, Harvard Graphics, The Norton Utilities, Lap-Link
PROFILE: PC road warrior
QUOTE: "I travel quite a bit, and I take a PC with me when I drive, though not so much when I fly. It's nice to have in a hotel room, so I can do some work in the evening."

ERIC BAILKE

gave the stamp of approval to PC Connection in Marlow, New Hampshire, proving that the best-run companies are not always the biggest (see the sidebar "Mail-Order Pride").

But knowing which products our readers voted for wasn't enough—we wanted to know *why*. So we called voters at random to get the skinny on their likes and dislikes, then posed the same questions to the "experts"—authors, developers, and those oft-quoted industry gurus. Who has more insight, the amateurs or the pros? See the sidebar "The People and the Pundits," and judge for yourself.

Of course, some things never change. Compaq won its fourth straight title as top desktop computer. And for the eighth year in a row *1-2-3*, *dBASE*, *Flight Simulator*, the Microsoft Mouse, and the Hayes Smartmodem captured their categories—but most margins of victory were tighter than ever. Will 1991 be the year when *Quattro* overtakes *1-2-3* or *Paradox* topples *dBASE?* Will most PC users finally make the long-awaited move to *Windows?*

We're not making any predictions. You'll just have to tune in next year for the ninth annual World Class Awards. Or better yet, grab a ballot and be a part of next year's avalanche.

Daniel Tynan is an assistant editor for PC World.

World Class ballots were tabulated by the Wilson Research Group in San Carlos, California.

THE PEOPLE AND THE PUNDITS

As the saying goes, if you laid all the experts in the world end to end, they'd still point in every single direction. In our calls to professional pundits and World Class voters, we encountered a wide range of viewpoints, but one theme echoed consistently throughout: Products must be easy to use and well supported. Two common traits among our respondents were a thorough knowledge of computing and a passion for well-designed hardware and software. Here's a sampling of some of the things they told us.

DATA BASES

Pundits: "Why do I use *dBASE?* Because the application generator is superb. The one in *dBASE IV* is a great tool, once you understand what you can do with it. It lets you develop and prototype decent applications without spending enormous amounts of time writing lines of code." *Edward Jones, author of* Using dBASE IV 1.1

"We're a data base–intensive office and we use *dBASE.* We'd have to see some incredible advantage to another program before we'd switch. Rewriting all of our applications would be a nightmare." *Jeffrey Tarter, editor of* Soft-letter

People: "I like *dBASE III.* It's easy to train people to do simple things, and as they gain more proficiency, the program grows along with them." *Nevin House, microcomputer specialist, Arlington, Virginia*

"I'm most impressed by the volume of information *dBASE* can manage. We keep humongous records on all the people who work in our department, and *dBASE* handles them no problem." *David Kinney, petty officer, U.S. Navy*

WORD PROCESSORS

Pundits: "I think *Word* has a superior feature set, but I can't tell anyone to abandon *WordPerfect* and go with *Word.* What would you rather drive, a Porsche or a BMW?

"The future is definitely in graphical word processors. If I had to pick a word processor today, I'd pick *Word* for DOS. Three years from now I'd probably pick *Word for Windows*—or even *WordPerfect for Windows*, depending on what they do with it." *Peter Rinearson, author of* Word Processing Power With Microsoft Word *and creator of* MasterWord, *the* Microsoft Word *companion disk*

People: "I love *Word for Windows.* It's so easy to use, and you can cut and paste pictures without a lot of keystrokes. After using *Windows, WordPerfect's* menus and function keys are frustrating." *Nancy Louis, PC consultant, Newton Square, Pennsylvania*

"I don't like graphical word processors. Bumping back and forth between the mouse and keyboard all the time—it gets irritating. The mouse has its uses, but when you're dealing with character-based programs, characters are what you want to put in there." *Don Sandell, MIS director, Minneapolis, Minnesota*

SPREADSHEETS

Pundits: "A lot of people are thoroughly disgusted with Lotus—but that doesn't mean corporations are about to throw *1-2-3* out the door. There's too much inertial mass built up, too much time and money invested in building their models." *Amy Wohl, president of Wohl Associates*

"*Quattro Pro* is a much better product than *1-2-3* release 3 and more powerful than release 2.2. *1-2-3*'s file-linking capability lets you open only one worksheet at a time. *Quattro* lets you open many worksheets and link them together—it's much more functional." *Steve Cobb, coauthor of* Douglas Cobb's 1-2-3 Release 2.2 Handbook *and a contributing author to* Quattro Companion

People: "I like *1-2-3* release 3. Why? I'm a power user. I like three dimensions, and nobody else has it. Borland says *Quattro* does, but it really doesn't. It lets you link spreadsheets, but it isn't true 3-D." *Don Sandell*

"I like *Excel,* but I prefer *Quattro* because you can run it in multiple interfaces. *1-2-3* users can jump into it and go. And you get all the fonts. *Excel* lets you add fonts, but Borland just hands them to you when you buy the product." *Dale Fanning, technician and LAN operator for cable TV network, Virginia Beach, Virginia*

OPERATING ENVIRONMENTS

Pundits: "Before *3.0, Windows* was a joke. I think *3.0* makes all the difference." *John Seybold, publisher of* The Seybold Report on Desktop Publishing

"The crux of *Windows'* popularity isn't multitasking but the consistent look and feel. It's easy to learn, and there are a bunch of fully featured applications." *Leon Chalnick, contributing editor,* Acknowledge, The Window Letter

People: "Other environments are Volkswagens—*Windows* is consistent and smooth. I didn't even crack the manual to learn *Ami Pro*—I just installed it and ran it." *Jess Olonoff, president, Docutech Inc.*

MAIL ORDER

Pundits: "Mail order has had a history of problems. Paper-thin margins and cutthroat prices have put some companies in precarious positions. But it's gotten better as the market has thinned out. I hear fewer horror stories now." *Tracy Licklider, president of the Boston Computer Society*

People: "CompuAdd is an incredible outfit. It's a little more expensive, but boy are they thorough. You discuss your

needs with them, and they tell you whether what you want is incompatible and what you should be getting. A lot of companies don't have a staff this savvy— they just send you what you order." *Nancy Louis*

"I love PC Connection. The service is great: You need it today, they send it. And they always send you the latest version of the software—not like some other companies." *Gayle Joas, PC consultant, Newton Square, Pennsylvania*

SERVICE AND SUPPORT

Pundits: "WordPerfect's support operation is the biggest and the best. They take good care of everybody. They don't ask you if you're a customer, because they figure if you aren't one now, next time out you will be." *Amy Wohl*

"I think service and support are as important as any other factor in choosing hardware and software. The trouble is, unless you've dealt with the company before, you only find out about these things *after* you've bought the product." *Tracy Licklider*

People: "I'd rather have a machine that's one generation behind the rest and have a good working relationship with the company that makes it than have my state-of-the-art machine fail, call a company 1500 miles away, and get a hard time over the phone." *Bill Dirk, graduate student/PC consultant, Austin, Texas*

"I'd pick Compaq over IBM. When something goes wrong, it's much easier to reach somebody and get something done." *Gayle Joas*

SYSTEMS

Pundits: "The Deskpro 386/33 is suited for applications most of us down here in the trenches would never dream of using. It's like naming a Lamborghini 'Car of the Year'—it's a system many people might like to have but not many are likely to buy." *Peter Lewis, computer columnist for the* New York Times

"Faster machines win because users put speed above everything else—they absolutely want performance. Whether they really need that power is a function of user profile. Programmers and *AutoCAD* users must have fast turnaround; for a *WordPerfect* guy, a slow 286 is absolutely as fast as he needs." *Steve Gibson,* InfoWorld *columnist and president of Gibson Research Corp.*

People: "I figure if you're going to get a new computer, you might as well get the most advanced in the field, because everything changes so rapidly. The machines that came out five years ago are obsolete." *Lars C. Christensen III, beef farmer, Elk Creek, Virginia*

"Right now, my Deskpro thinks about as fast as I can type. Unless we install a network, I see no use for a 33-MHz machine." *Michael Thomas, accounting manager, Omaha, Nebraska*

MAIL-ORDER PRIDE: SERVICE AND SUPPORT ARE THE KEY

The most popular mail-order firms in our survey share certain characteristics: fast delivery, money-back guarantees, and strong support policies. Here's how the six top vote-getters compare.

If all the same, mention in text, not table.

	PURCHASE AND RETURN POLICIES						TECHNICAL SUPPORT					
	Estimated delivery time[1]	Accepts credit cards	Charges card before shipping	Money-back guarantee	Extended warranties	Volume discount	On-site service	Free phone support	Toll-free number	Technical support hours	BBS support	Fax support
PC CONNECTION	1 to 2 days	yes	no	no[2]	no	yes	no	unlimited	yes	M–F 9–5:30	no	yes
COMPUADD	3 to 5 days	yes	no	30 days	systems only	yes	yes	unlimited lifetime	yes	M–F 8–7	yes	yes
DELL COMPUTER	4 days	yes	no	30 days	yes	yes	yes[3]	unlimited	yes	M–F 7–7	yes	yes
TELEMART	1 to 2 days	yes	no	30 days	no	yes	yes[4]	—[5]	n/a	n/a	no	yes
GATEWAY 2000	within 2 weeks	yes	no	30 days (hardware only)	yes[6]	yes	yes[4]	unlimited lifetime	yes	M–F 8 a.m.–10 p.m., S 9–4	yes	yes
NORTHGATE COMPUTER SYSTEMS	within 2 weeks	yes	no	30 days	yes	yes	yes[7]	unlimited	yes	24 hours, 7 days	yes	yes

[1] Vendor estimate.
[2] No formal policy; determined on case-by-case basis
[3] Through Xerox. First year free, additional support approximately 10 percent of system cost per year
[4] Through TRW
[5] Support for MIT brand systems only, provided by manufacturer.
[6] One year free parts and labor; thereafter, free labor and lifetime free phone support.
[7] Through Bell Atlantic.

HARDWARE

DESKTOP COMPUTER

%	Product	Manufacturer
6	**Compaq Deskpro 386/33**	**Compaq Computer**
5	Compaq Deskpro 386s	Compaq Computer
5	Dell System 325	Dell Computer
3	IBM PS/2 Model 80	IBM
3	IBM PS/2 Model 70 486/25	IBM
78	Others	

75% of the respondents voted in this category

TRANSPORTABLE COMPUTER

%	Product	Manufacturer
15	**Compaq Portable 386**	**Compaq Computer**
11	IBM PS/2 Model P70	IBM
8	Toshiba T5200	Toshiba
7	Compaq Portable III	Compaq Computer
5	Compaq SLT/286	Compaq Computer
5	Toshiba T3200SX	Toshiba
49	Others	

32% of the respondents voted in this category

LAPTOP COMPUTER

%	Product	Manufacturer
15	**Compaq LTE/286**	**Compaq Computer**
6	Toshiba T5200	Toshiba
6	Toshiba T1600	Toshiba
4	Toshiba T3200	Toshiba
4	Compaq SLT/286	Compaq Computer
65	Others	

49% of the respondents voted in this category

LASER PRINTER

%	Product	Manufacturer
37	**HP LaserJet Series II**	**Hewlett-Packard**
26	HP LaserJet Series IIP	Hewlett-Packard
11	HP LaserJet Series IID	Hewlett-Packard
3	LaserJet Series III	Hewlett-Packard
2	NEC Silentwriter LC890	NEC Technologies
21	Others	

66% of the respondents voted in this category

DOT MATRIX PRINTER

%	Product	Manufacturer
14	**Panasonic KX-P1124**	**Panasonic**
9	Epson LQ-2550	Epson America
6	Epson LQ-1050	Epson America
4	Epson LQ-850	Epson America
3	Panasonic KX-P1624	Panasonic
64	Others	

64% of the respondents voted in this category

MONITOR

%	Product	Manufacturer
16	**NEC MultiSync 3D**	**NEC Technologies**
15	NEC MultiSync 2A	NEC Technologies
7	NEC MultiSync 5D	NEC Technologies
4	Zenith ZCM-1490	Zenith Data Systems
4	NEC MultiSync 4D	NEC Technologies
54	Others	

53% of the respondents voted in this category

MOUSE

%	Product	Manufacturer
50	**Microsoft Mouse**	**Microsoft**
33	Logitech Series 9 Mouse	Logitech
3	Trackman Stationary Mouse	Logitech
2	PC Mouse	Mouse Systems
12	Others	

46% of the respondents voted in this category

MODEM

%	Product	Manufacturer
33	**Smartmodem 2400**	**Hayes Microcomputer Products**
4	Smartmodem 1200	Hayes Microcomputer Products
4	Intel 2400EX	Intel
4	V-series Smartmodem 9600	Hayes Microcomputer Products
4	Courier HST 9600	U.S. Robotics
51	Others	

39% of the respondents voted in this category

GRAPHICS BOARD

%	Product	Manufacturer
18	**VGA Wonder**	**ATI Technologies**
12	VGA Plus	Paradise Systems
6	VGA Professional	Paradise Systems
4	V-RAM VGA	Video Seven
4	Hercules Graphics Card	Hercules Computer Technology
56	Others	

28% of the respondents voted in this category

MASS STORAGE

%	Product	Manufacturer
12	**Seagate ST251-1**	**Seagate Technology**
9	Seagate ST4096	Seagate Technology
5	Hardcard 80II	Plus Development
3	MW-5U1 WORM Drive	Mitsubishi
3	Bernoulli Box II 44	Iomega
2	Bernoulli Box II	Iomega
66	Others	

24% of the respondents voted in this category

PHOTOGRAPHS BY FRED STIMSON

SCANNER

%	Product	Manufacturer
35	**HP ScanJet Plus**	**Hewlett-Packard**
26	SconMon	Logitech
5	Complete Page Sconner	The Complete PC
5	Hondy Sconner 3000	DFI
4	MSF-300G	Microtek
25	Others	

20% af the respondents voted in this categary

MEMORY EXPANSION BOARD

%	Product	Manufacturer
41	**AboveBoard Plus**	**Intel**
14	Rampage Plus	AST Research
6	SixPakPlus	AST Reseorch
4	Inboard 386	Intel
35	Others	

19% af the respandents voted in this categary

MOST PROMISING NEWCOMER—HARDWARE

%	Product	Manufacturer
10	**HP LaserJet Series IIP**	**Hewlett-Packard**
6	Compoq Systempro	Compaq Computer
4	Compaq LTE/286	Compoq Computer
4	Next Computer	Next
3	Compoq Deskpro 486/25	Compaq Computer
3	Poqet PC	Poqet
70	Others	

19% af the respandents voted in this categary

SOFTWARE

WORD PROCESSING

%	Product	Manufacturer
54	**WordPerfect**	**WordPerfect**
13	Microsoft Word	Microsoft
8	WordStor Professional	WordStar Int'l
5	Professional Write	Software Publishing
5	Word for Windows	Microsoft
15	Others	

85% af the respondents voted in this categary

SPREADSHEET

%	Product	Manufacturer
34	**1-2-3 2.xx**	**Lotus Development**
23	Quottro Pro	Borland Int'l
15	Excel	Microsoft
13	1-2-3 3	Lotus Development
4	SuperCalc5	Computer Associates
11	Others	

72% af the respondents voted in this categary

UTILITY

%	Product	Manufacturer
32	**PC Tools Deluxe**	**Central Point Software**
29	Norton Utilities Advanced	Symontec
8	XtreePro Gold	Executive Systems
5	Norton Commonder	Symontec
2	Mogellon	Lotus Development
2	Fastbock Plus	Fifth Generotion
22	Others	

46% af the respandents voted in this categary

RELATIONAL DATA BASE

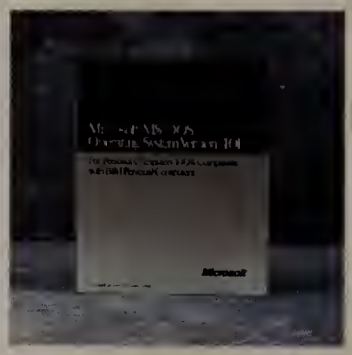
%	Product	Manufacturer
23	**dBASE IV**	**Ashton-Tate**
20	Porodox	Borland Int'l
14	dBASE III Plus	Ashton-Tate
8	R:base for DOS	Microrim
7	FoxPro	Fox Software
28	Others	

42% af the respandents vated in this categary

OPERATING SYSTEM/ ENVIRONMENT

%	Product	Manufacturer
41	**MS-DOS/PC-DOS 3.xx**	**Microsoft/IBM**
18	MS-DOS/PC-DOS 4.xx	Microsoft/IBM
16	Microsoft Windows 2.xx	Microsoft
7	Desqview 2.xx	Quarterdeck
6	OS/2	Microsoft/IBM
12	Others	

40% af the respondents voted in this categary



COMMUNICATIONS

%	Product	Manufacturer
53	**Procomm Plus**	**Datastorm Technologies**
6	Smortcom III	Hoyes Microcomputer Products
4	Crosstolk XVI	DCA/Crosstalk Communicotions
4	Telix	Exis
4	Crosstolk Mk.4	DCA/Crosstalk Communications
29	Others	

38% af the respandents voted in this categary

DESKTOP PUBLISHING

%	Product	Manufacturer
37	**PageMaker**	**Aldus**
32	Ventura Publisher	Venturo Software
9	First Publisher	Software Publishing
6	Publish-It	Timeworks
2	WordPerfect	WordPerfect
14	Others	

37% af the respondents voted in this categary

PROGRAMMING LANGUAGE

%	Product	Manufacturer
20	**Turbo Pascal**	**Borland Int'l**
18	Turbo C	Borland Int'l
17	QuickBASIC	Microsoft
12	Microsoft C	Microsoft
6	QuickC	Microsoft
27	Others	

29% of the respondents voted in this category

PERSONAL FINANCE

%	Product	Manufacturer
43	**Quicken 3.0**	**Intuit Software**
30	Andrew Tobias' Managing Your Money	MECA Software Inc.
14	Money Counts	Parsons Technology
3	Dollars and Sense	Managram
10	Others	

28% of the respondents voted in this category

DRAW/PAINT

%	Product	Manufacturer
36	**PC Paintbrush**	**Z-Soft**
25	Corel Draw	Corel Systems
4	Designer	Micrografx
3	Deluxe Paint II	Electronic Arts
3	Harvard Graphics	Software Publishing
29	Others	

28% of the respondents voted in this category

GAME

%	Product	Manufacturer
16	**Microsoft Flight Simulator**	**Microsoft**
8	Leisure Suit Larry	Sierra On-Line
7	Tetris	Spectrum Holobyte
4	F-19 Stealth Fighter	Microprose
4	SimCity	Maxis
4	King's Quest	Sierra On-Line
57	Others	

27% of the respondents voted in this category

PRESENTATION GRAPHICS

%	Product	Manufacturer
59	**Harvard Graphics**	**Software Publishing**
15	Freelance Plus	Lotus Development
3	Draw Applause	Ashton-Tate
2	Graph Plus	Micrografx
21	Others	

26% of the respondents voted in this category

TAX PLANNING OR PREPARATION

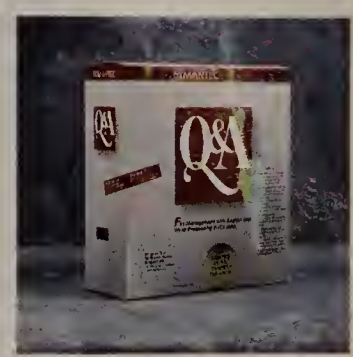
%	Product	Manufacturer
64	**TurboTax**	**Chipsoft**
14	Tax Cut	MECA Software Inc.
5	Personal Tax Preparer	Parsons Technology
2	AM-Tax Advanced	AM Software
2	Andrew Tobias' Managing Your Money	MECA Software Inc.
13	Others	

26% of the respondents voted in this category

FLAT-FILE DATA BASE

%	Product	Manufacturer
27	**Q&A 3.0**	**Symantec**
15	Reflex	Borland Int'l
14	PC-File Plus	ButtonWare
8	Professional File	Software Publishing
7	Alpha Four	Alpha Software
29	Others	

22% of the respondents voted in this category



INTEGRATED

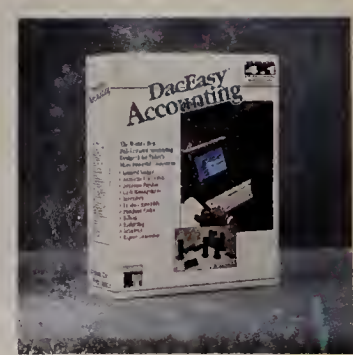
%	Product	Manufacturer
37	**Microsoft Works**	**Microsoft**
12	First Choice	Software Publishing
9	Symphony	Lotus Development
7	Enable/OA	Enable Software
6	Framework III	Ashton-Tate
6	SmartWorld	Informix
23	Others	

21% of the respondents voted in this category

ACCOUNTING

%	Product	Manufacturer
22	**DacEasy Accounting**	**DacEasy**
17	Peachtree Complete III	Peachtree Software
12	Quicken 3.0	Intuit Software
5	Accpac Plus	Computer Associates
3	Money Counts Plus	Parsons Technology
41	Others	

21% of the respondents voted in this category



WORD PROCESSING UTILITY

%	Product	Manufacturer
28	**Grammatik**	**Reference Software Int'l**
19	RightWriter	RightSoft
6	WordPerfect Executive	WordPerfect
5	WordPerfect Library	WordPerfect
2	Fontware	Bitstream
40	Others	

20% of the respondents voted in this category

PERSONAL ORGANIZER

%	Product	Manufacturer
19	**SideKick Plus**	**Borland Int'l**
16	Agendo	Lotus Development
13	PC Tools Deluxe	Central Point Software
7	Current	IBM
5	WordPerfect Library	WordPerfect
40	Others	

19% of the respondents voted in this category

COMPUTER-AIDED DESIGN

%	Product	Manufacturer
54	**AutoCAD**	**Autodesk**
12	Generic CADD	Generic Software
10	DesignCAD	American Small Business
3	AutoSketch	Autodesk
2	EasyCAD	Evolution
19	Others	

19% of the respondents voted in this category

SPREADSHEET UTILITY

%	Product	Manufacturer
43	**Allways 1.2**	**Funk Software**
14	Sideways	Funk Software
7	SeeMore	Personics
4	1-2-3 2.*xx*	Lotus Development
3	Impress	PC Publishing
29	Others	

17% of the respondents voted in this category

ON-LINE SERVICE/BBS

%	Product	Manufacturer
54	**CompuServe**	**CompuServe**
16	Prodigy	Prodigy Services
8	GEnie	General Electric
22	Others	

17% of the respondents voted in this category

PROJECT MANAGER

%	Product	Manufacturer
25	**Time Line**	**Symantec**
19	Harvard Project Manager	Software Publishing
12	Project Scheduler 4	Scitor
9	SuperProject	Computer Associates
7	Microsoft Project	Microsoft
28	Others	

12% of the respondents voted in this category

For more information about all products in this article, circle reader service no. 908.

DATA BASE UTILITY

%	Product	Manufacturer
15	**Clipper**	**Nantucket**
10	R&R Report Writer	Concentric Data
8	dBASE IV	Ashton-Tate
6	dBASE III Plus	Ashton-Tate
4	Q&A 3.0	Symantec
57	Others	

9% of the respondents voted in this category

MOST PROMISING NEWCOMER—SOFTWARE

%	Product	Manufacturer
6	**Quattro Pro**	**Borland Int'l***
6	Word for Windows	Microsoft
4	Magellan	Lotus Development
3	Animator	Autodesk
81	Others	

18% of the respondents voted in this category

*Percentages rounded; product received largest number of votes.

READER POLL

LOCAL AREA NETWORK—OPERATING SYSTEM

%	Product
52	**Advanced Netware/286 (Novell)**
8	Advanced Netware/386 (Novell)
7	LANtastic (Artisoft)
4	VINES (Banyan Systems)
4	3+Share (3Com)
25	Others

14% of the respondents voted in this category

LOCAL AREA NETWORK—BOARD

%	Product
11	**Token-Ring (IBM)**
9	Etherlink (3Com)
8	LANtastic board (Artisoft)
8	EtherCard Plus (Western Digital)
6	Arcnet board (Standard Microsystems)
58	Others

9% of the respondents voted in this category

BEST SERVICE AND SUPPORT—SOFTWARE COMPANY

%	Company
37	**WordPerfect**
14	Microsoft
5	Borland Int'l
4	Lotus Development
2	Central Point Software
38	Others

27% of the respondents voted in this category

BEST SERVICE AND SUPPORT—HARDWARE COMPANY

%	Company
13	**IBM***
13	Dell Computer
7	Hewlett-Packard
6	Northgate Computer Systems
6	Compaq
5	Gateway 2000
50	Others

22% of the respondents voted in this category

*Percentages rounded; company received largest number of votes.

BEST MAIL-ORDER COMPANY

%	Company
25	**PC Connection**
17	CompuAdd
8	Dell Computer
4	Telemart
4	Gateway 2000
3	Northgate Computer Systems
39	Others

30% of the respondents voted in this category

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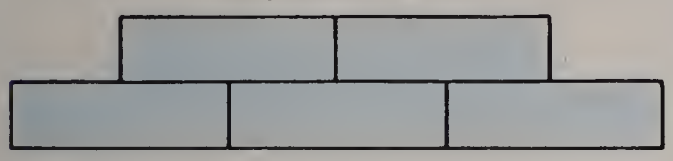

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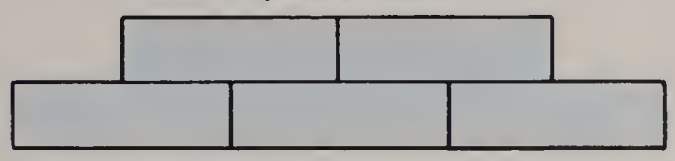

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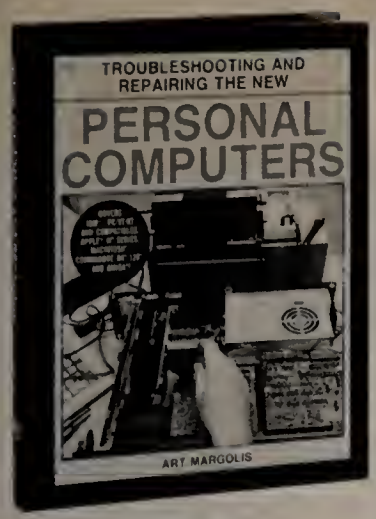
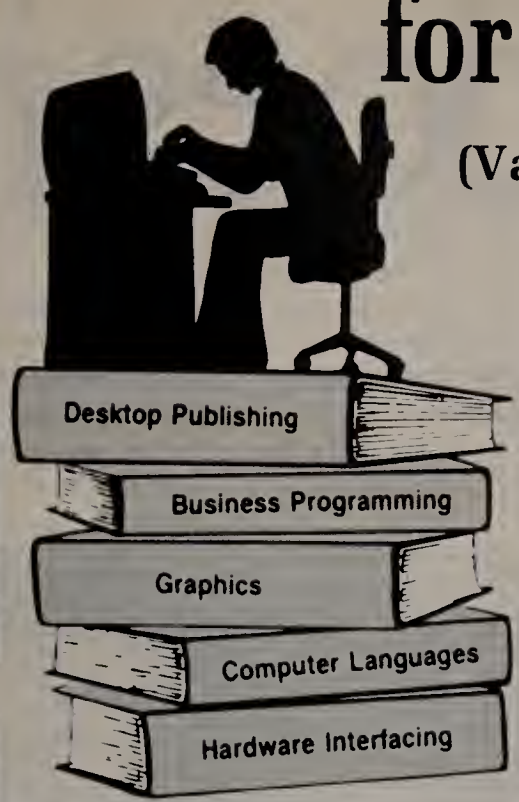


2809 $29.95



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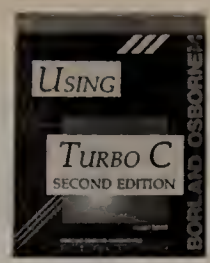
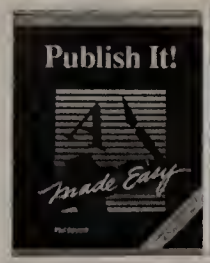


15024P $22.95

9808 $34.95



15023P $21.95

9309P $28.95
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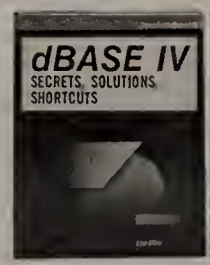

15011P $24.95

3617 $34.95
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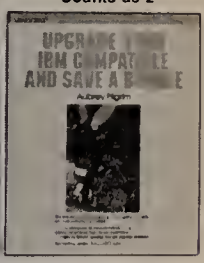

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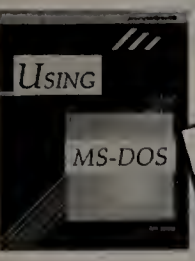

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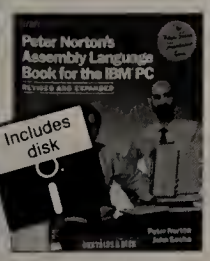

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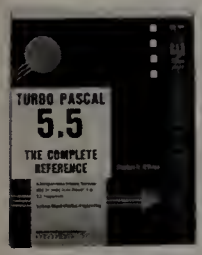

15005P $26.95
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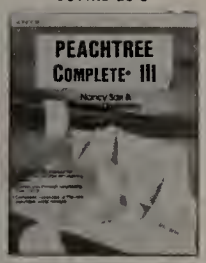

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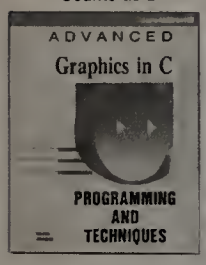
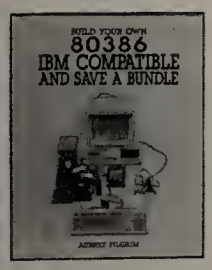


15001P $22.95



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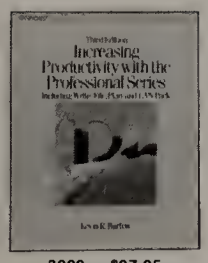

3299 $27.95
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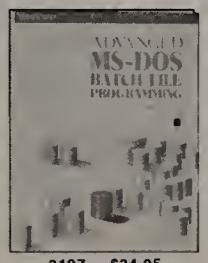

3197 $34.95
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3228P $22.95
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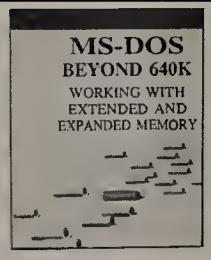
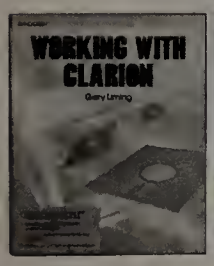


3239 $29.95



3403 $29.95
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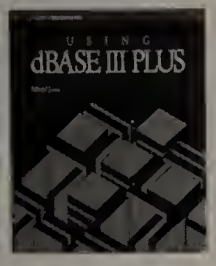
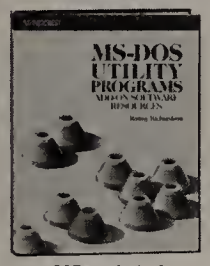
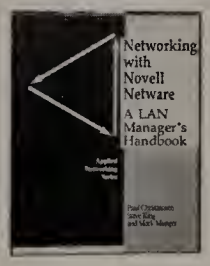


15002P $18.95



3278 $34.95
Counts as 2



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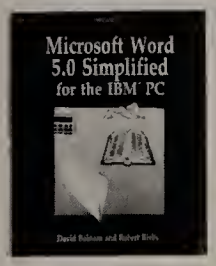

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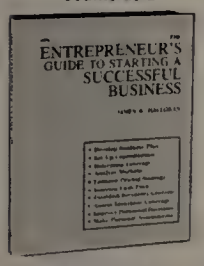

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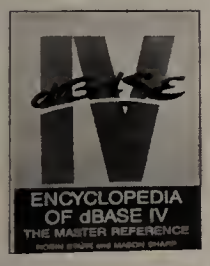

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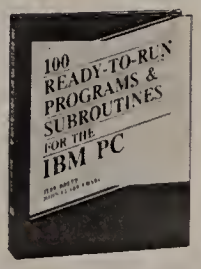

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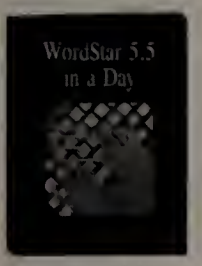

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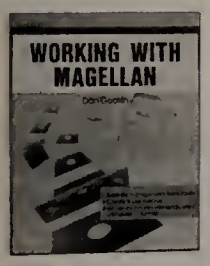

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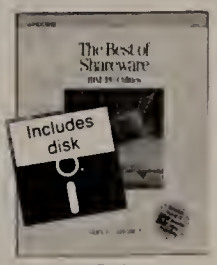

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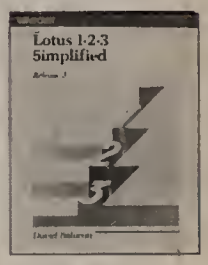

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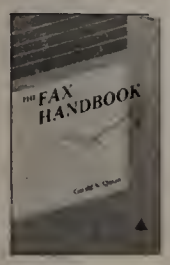

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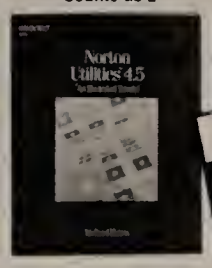

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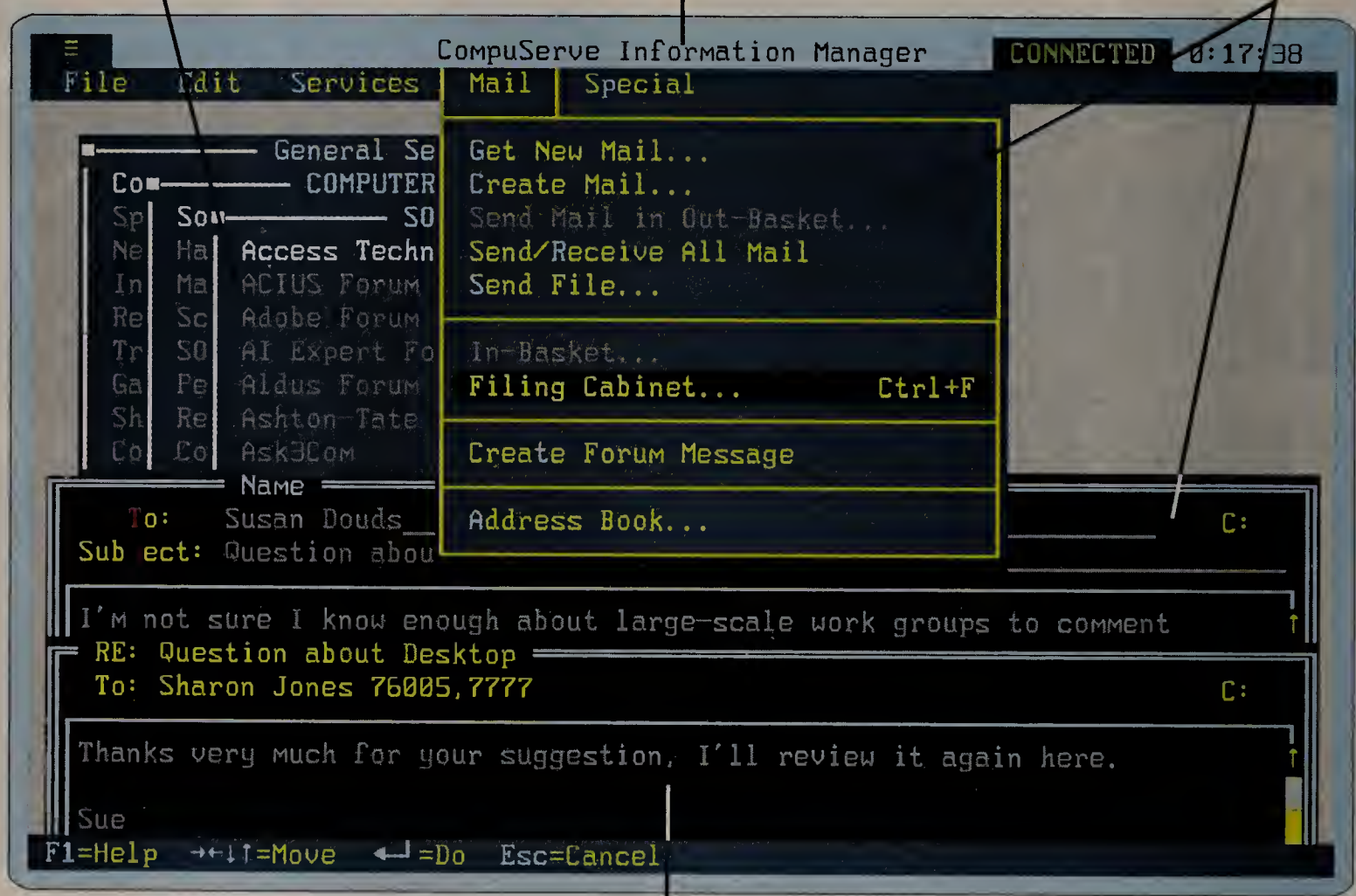

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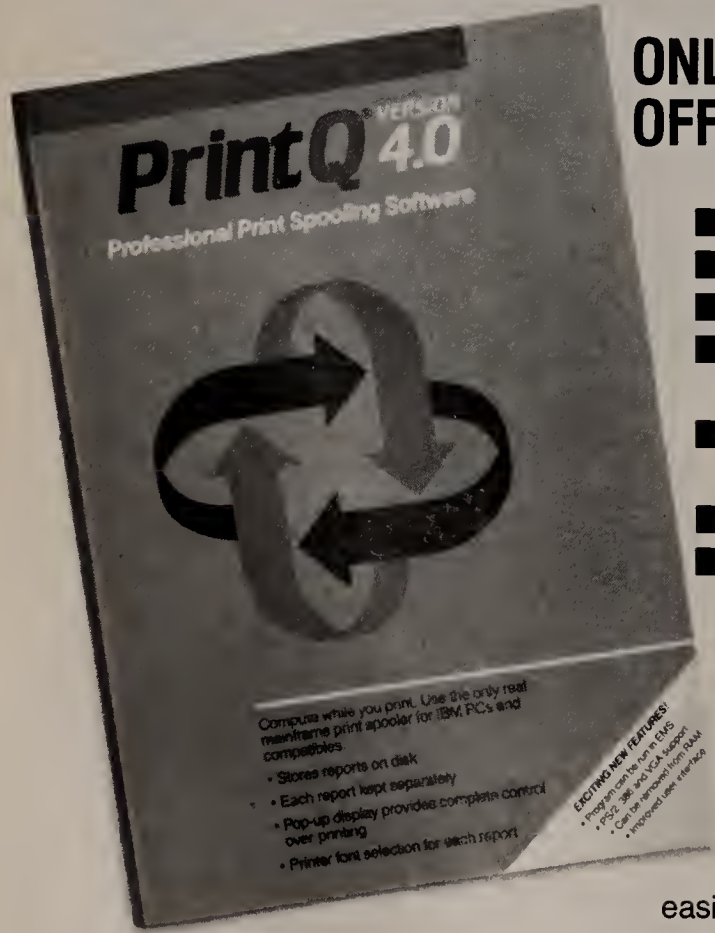

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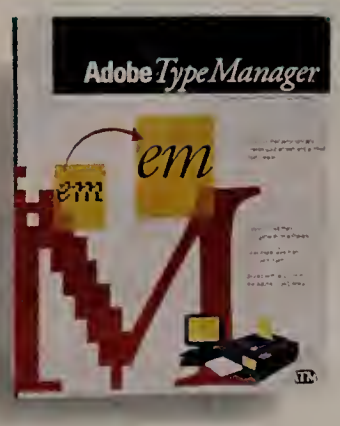

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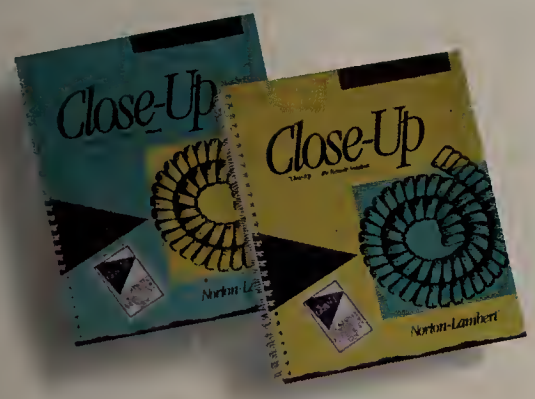

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4928 □*Close-Up Customer/Terminal 3.0.* $135.
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7010 □Windows 3.0 . . . . . 99.
7388 ▣Project for Windows 1.0 . . . . . 469.
7387 ▣PowerPoint for Windows 1.0. . . . 329.
2904 □Works 2.0 . . . . . 99.
2901 □Word 5.0 . . . . . 209.
6195 ▣Word for Windows 1.0 . . . . . 329.
2856 ▣Excel 2.1 . . . . . 329.
2894 □QuickBASIC 4.5. . . . . 69.
2895 □QuickC 2.5 . . . . . 69.
2853 ▣C Compiler 6.0 . . . . . 339.
Multisoft ... NCP
4925 □PC-Kwik Power Pak 1.5 . . . . . 79.
Nolo Press ... NCP
2982 □WillMaker 4.0. . . . . 39.
Norton-Lambert ... NCP
4928 □Close-Up Customer 3.0 . . . . . 135.
4929 □Close-Up Support 3.0 . . . . . 165.
5421 ⊞Close-Up LAN *(16 user)* . . . . . 639.

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5900 □PC USA 1.0 . . . . . 39.
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4384 ▣Ultravision 2.0 . . . . . 79.
7048 ▣Monarch 1.0 *(Data Mgmt. Tool)* . 319.
Precision Software ... NCP
6600 ▣Superbase 4 for Windows 1.2 . . 469.
Qualitas ... NCP
7539 □386MAX 5.0 . . . . . 75.
Quarterdeck ... NCP
6422 □QRAM 1.0 . . . . . 49.
3221 □Expanded Memory Mgr. 386 5.1 . 59.
3220 □DESQView 2.26. . . . . 79.
4586 □DESQView 386 1.1 . . . . . 129.

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7483 ▣Grammatik for Windows 1.0. . . . . 52.
Revolution Software ... NCP
4480 ▣VGA Dimmer 2.01 *(screen saver)* . 19.
RightSoft ... NCP
4155 ▣RightWriter 4.0. . . . . 55.
Samna ... NCP
5799 ▣Ami Professional 1.2 . . . . . 309.
Softlogic Solutions ... NCP
3542 □Software Carousel 4.0 . . . . . 55.
Software Publishing ... NCP
4602 □PFS:Preface 1.0. . . . . 49.
3499 □PFS:First Publisher 3.0 . . . . . 99.
3478 □PFS:First Choice 3.02 . . . . . 105.
3496 □Professional Write 2.2. . . . . 165.
3482 □Harvard Graphics 2.3 . . . . . 339.
Spinnaker ... NCP
7604 ▣Plus for Windows 1.0 . . . . . 289.

Intel ... 5 years
Above Boards—FREE Quarterdeck QRAM and Manifest with any Above Board or piggyback, now through December 31, 1990! . . . . . **see Intel listing for prices.**

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3425 □Q&A 3.0 . . . . . 229.
3431 □Timeline 4.0. . . . . 469.

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TIMESLIPS ... NCP
2987 □Timeslips III 3.4. . . . . 169.
6994 □PercentEdge 1.0 . . . . . 69.

Timeworks ... NCP
6253 ▣Publish-It! 1.1 . . . . . 115.

TOPS ... NCP
6675 □TOPS Network Bundle 3.0. . . . . 159.
3720 Flashcard 2.1 *(AppleTalk network card; 1 year warranty)* . . . . . 155.

Touchstone Software ... NCP
7420 ▣Check It 2.1 . . . . . 89.

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3561 ▣True BASIC 2.1 . . . . . $52.

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6771 ▣Memory Master 1.1 . . . . . 45.

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6246 □Volkswriter 4 1.02 . . . . . 109.

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7577 □PC-FullBak+ 1.12. . . . . 52.
7574 ▣PathMinder+ 1.0 . . . . . 79.
7575 ▣ValuePak *(includes 4 programs)* . . 69.

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6685 ▣DrawPerfect 1.1 . . . . . 279.

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6791 □WordStar Prof. 6.0 . . . . . 279.

Xerox ... NCP
3812 □Ventura Publisher Gold 3.0 . . . . . 559.

XTREE ... NCP
6161 ▣XTreePro Gold 1.4 . . . . . 75.

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5851 ▣SimCity . . . . . 33.

Electronic Arts ... NCP
5804 ▣Deluxe Paint II *(Enhanced)*. . . . . 89.

Microsoft ... NCP
2858 □Flight Simulator 4.0 . . . . . 39.

Penton Overseas ... NCP
▣VocabuLearn/ce Levels I & II (French, Italian, German, Spanish, Russian, Hebrew and Japanese). . . . . *each* 39.

Sierra On-Line ... CP
6023 ▣Leisure Suit Larry III . . . . . 39.
6796 ▣Codename: Iceman. . . . . 39.
6972 ▣Conquests of Camelot . . . . . 39.

Software Toolworks ... NCP
6436 ▣Hunt for Red October . . . . . 20.
4659 ▣Chessmaster 2100 *(CP)* . . . . . 35.

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7552 *NetPort*–New! Provides an easy and compact solution for connecting printers directly to Thin-wire Ethernet LAN's running NetWare 2.1x or NetWare 286. Install in minutes at any T-connector. $489.

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3439 ▣2nd Math *(ages 7 to 16)* . . . . . 27.

True BASIC, Inc. ... NCP
▣Kemeny/Kurtz Math Series. *each* 45.

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Manufacturer's standard limited warranty period for items shown is listed after each company name. Some products in their line may have different warranty periods.

American Power ... 2 years
7108 APC Smart-UPS 400. . . . . 339.
6811 360SX *(stand-by power source)*. . . 255.
7107 450AT *(stand-by power source)*. . . 339.
7106 520ES *(stand-by power source)*. . . 399.
7105 600LS *(stand-by power source)*. . . 469.

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1299 SixPakPlus 384k C/S/P . . . . . 179.
6795 SixPak 286 512k. . . . . 209.
4107 RAMpage Plus 286 512k. . . . . 419.
6980 VGA Plus *(w/512K) (800 x 600 res)* 229.

Boca Research ... 5 years
7001 BOCARAM/AT PLUS *(0-8 Meg) (LIM 4.0 extended)* . . . . . 125.
7061 BOCARAM/XT 0K *(0-2 Meg, LIM 4.0)* 99.
7135 TophAT *(16-bit backfill 512K to 640K)* 99.
6998 I/O Board for AT . . . . . 59.
6999 I/O Board for Microchannel S/S/P . 109.
6995 SuperVGA *(800 x 600, 16/8 bit)* . . . 115.
7026 1024 VGA *(16 bit non-interlaced)* . . 149.

Bravo Communications
7400 2 Pos. Laser Compatible Switch Box 109.

Brother International ... 1 year
5787 HL-8e Laser Printer *(HP2 comp.)*. 1399.

CH Products ... 1 year
7341 Gamecard III Plus *(for Microchannel PS/2s)*. . . . . 49.
7340 Flight Stick . . . . . 49.
7345 Rollermouse *(Trackball) serial* 85. *bus* 99.

Compucable ... 2 years
1604 2-Position switch box . . . . . 25.

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Intel ... 5 years
MNP Modems–Feature data compression, error correction, & a built-in buffer providing compatibility with OS/2.
6421 *2400B MNP Internal Modem* ..... $199.
6420 *2400EX MNP Modem* ..... 229.

Curtis ... lifetime
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7358 Command Center ..... 93.
Glass Filter Plus *(specify size)* .. ea. 65.

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6901 Switchboard ..... 175.

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We are an authorized Epson Service Center.
1906 FX-850 *(80 col., 264 cps, 9 pin)* ... call
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5183 LQ-510 *(80 col., 180 cps, 24 pin)* ... call
1930 LQ-850 *(80 col., 264 cps, 24 pin)* .. call
6765 LQ-1010 *(136 col., 180 cps, 24 pin)* call
1917 LQ-1050 *(136 col., 264 cps, 24 pin)* call
5184 LX-810 *(80 col., 180 cps, 9 pin)* .... call
1052 Printer-to-IBM cable *(6 feet)* ..... 15.
7775 Equity LT-286e Laptop ..... 2297.
7774 Equity LT-386SX Laptop ..... 3069.
Removable Hard Drives for Epson Laptops
7776 *20 Meg* .. 499. 7777 *40 Meg* .. 699.

5th Generation ... 1 year
7157 Logical Connection Plus 512k .... 599.

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2307 Smartmodem 2400 ..... 349.
7391 Ultra 9600 Modem ..... 899.

Hewlett-Packard ... 1 year
6754 LaserJet III *(w/toner)* ..... 1699.
6582 LaserJet IIP *(w/toner)* ..... 1069.

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6421 2400B MNP Internal Modem .... 199.
2352 2400B Internal Modem 2 *(for PS/2)* 249.
5119 2400 Baud External Modem ..... 179.
6420 2400EX MNP Modem ..... 229.
2346 Inboard 386/PC w/1 Meg *(w/free Ami)* 519.
4266 Above Board Plus 512k ..... 369.
4267 Above Board Plus I/O 512k ..... 399.
5336 Above Board Plus 8 2 Meg ..... 599.
5342 Above Board Plus 8 I/O 2 Meg ... 629.
4272 Above Board 2 Plus 512k ..... 469.
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2372 80387-20 *(for 20 MHz 80386 CPU's)* 399.

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4518 101 Plus Keyboard ..... 99.

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5802 Trackball ..... 69.

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7768 C9 Mouse with Windows ..... 149.
5151 HiREZ Mouse *(C9)* ..... 85.
6029 Trackman *(Trackball) serial* 85. *bus* 89.
4297 ScanMan Plus *(hand scanner)* ... 185.

Micron Technology ... 2 years
6669 Intensify 2 Meg Expansion for HP LaserJet II *(upgradeable to 4 Meg)* 219.
7012 Beyond Memory Board for PS/2 Model 70 *(2 Meg)* ..... 265.

Microsoft ... lifetime
2897 Mouse with Paintbrush ..... 109.
2898 Mouse with Windows 3.0 ..... 149.

Intel ... 5 years
2346 *Inboard 386/PC with Free Samna Ami*–Gives you 80386 processing power, 1 Mb RAM, and Samna's powerful Windows-based word processor (regularly at $129). 30 Day Money Back Guarantee ..... $519.

MicroSpeed ... 1 year
6007 PC-TRAC Trackball *serial* 75. *bus* 85.

Mouse Systems ... lifetime
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4306 PC Mouse II w/PC Paint+ ..... 89.

NEC ... 2 years
4799 Multisync 2A *(VGA Monitor)* ..... 499.
5085 Multisync 3D Monitor ..... 689.

Orchid Technologies ... 4 years
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7072 25 Cartridges in One! *(for LJ III)* ..... 349.
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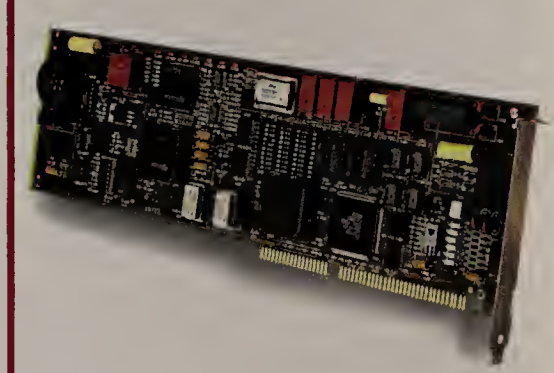
7758 *3 Meg* ... 279. 7759 *4 Meg* ... 339.
6839 Memory upgrade for LaserJet II
1 Meg ..... 179. *2 Meg* ..... 249.
7158 Pacific Page *(PostScript Cartridge for LaserJet IIP/III)* ..... 379.
7632 Outlines I . 209. 7631 Outlines II . 209.
7634 Pacific T Memory *(2MB)* ..... 219.

Practical Peripherals ... 5 years
3101 1200 Baud Internal Modem ..... 65.
3100 1200 Baud External Modem *(mini)* . 77.
3103 2400 Baud Internal Modem ..... 135.
3102 2400 Baud External Modem ..... 179.
5286 2400 Baud Int. MNP Modem *(Lev. 5)* 175.
5285 2400 Baud Ext. MNP Modem *(Lev. 5)* 209.
4542 2400 Baud Internal Modem for PS/2 . 229.



Intel ... 5 years
7782 *SatisFAXtion*–Send and receive faxes from within most applications using the print command. Built-in 2400 bps MNP modem standard. Includes coupons for free PC Tools and Fax-It software ..... $399.

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4899 Nylon Laptop carrying case . . . . . 55.
6037 Premier leather carrying case . . . . 199.
TheComplete PC ... 2 years
5140 TheComplete Page Scanner. . . . . 549.
5828 TheComplete Communicator . . . . 559.
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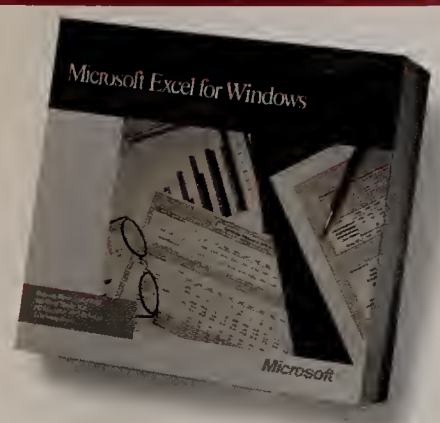
6199 Isobar 4-6 *(4 outlets, 6 ft. cord)* . . . . 49.
6200 Isobar 6-6 *(6 outlets, 6 ft. cord)* . . . . 59.
Video 7 ... 7 years
5883 1024i VGA *(includes 512k)* . . . . . 269.
4931 VRAM VGA 512k . . . . . 379.



Microsoft ... NCP
2856 ▣ *Excel for Windows 2.1*–Powerful spreadsheet featuring high-quality graphics and all the benefits of the Windows interface. Display and link multiple data files on screen simultaneously . . . . . $329.

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5116 Bernoulli II Single 44 Meg Internal 995.
5113 44 Meg Cartridge Tripak *(5¼")*. . . 249.
2499 PC2 Controller . . . . . 169.
7551 Bernoulli II Transportable 44 Meg . 997.
Mountain Computer ... 1 year
2917 40-60 Meg Internal Tape Drive . . . 299.
5502 83-152M Ext. Tape Drive. . . . . 799.
5500 83-152M Int. Tape Drive . . . . . 629.
5190 DC2000 Pre-formatted Cartridges ea. 35.
Pacific Rim ... 1 year
5010 1.2 Meg External *(for PS/2's)* . . . . . 215.
6602 1.44 External *(for PC/XT/AT)* . . . . . 239.
Plus Development ... 2 years
6425 Hardcard II 40 Meg *(19 ms)* . . . . . 599.
6424 Hardcard II 80 Meg *(19 ms)* . . . . . 699.
Seagate ... 1 year
2285 20 Meg Int. Hard Drive ST225 *(w/controller and cables, 65 ms)* . . 255.
2286 30 Meg Int. Hard Drive ST238R *(w/controller and cables, 65 ms)* . $269.
4554 40 Meg Int. HD ST251-1 (28 ms) . . 329.
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4951 720k Drive *(specify XT or AT, 3½")* . 75.
4670 1.44 Meg Drive for PC/XT *(3½")*. . . 89.
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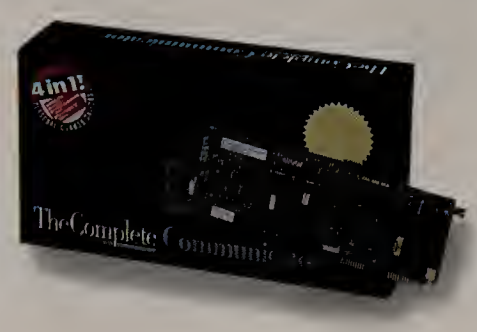
2789 5¼" MD2-D 360k Disks *(Qty. 10)* . . . . 12.



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2793 3½" DS/HD 1.44Mb Diskettes *(Qty. 10)* 27.
Sony ... lifetime
3291 5¼" DS/DD 360k Disks *(Qty. 10)* . . . . 10.
3292 5¼" DS/HD 1.2Mb Disks *(Qty. 10)* . . . 19.
3297 3½" DS/DD 720k Diskettes *(Qty. 10)*. . 13.
3298 3½" DS/HD 1.44Mb Diskettes *(Qty. 10)* 22.
6659 QD 2000 Tape Cartridge . . . . . 19.

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6556 256k DRAMs *(100 nanosecond)*. . . call
3248 256k DRAMs *(120 nanosecond)*. . . call
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Who Pays for Tech Support?

THE ERA OF FREE TECHNICAL SUPPORT IS NEARLY PAST. BUT PC USERS DON'T HAVE TO SETTLE FOR SECOND-RATE SERVICE AT OUTRAGEOUS RATES. HERE'S WHAT YOU HAVE A RIGHT TO EXPECT.

Roberta Furger

IN THE EARLY DAYS, PC software and hardware companies set a high standard for customer support: Technical advice was free and only a phone call away. Although they didn't always live up to their promises, most companies at least paid lip service to this ideal.

But today, more and more companies are defecting from the ranks, arguing that free support is no longer a realistic expectation. And a *PC World* survey of 1000 business users, backed by extensive interviews with users and vendors, shows the gulf is broadening between what vendors are willing and able to provide and what most users have come to expect.

Vendor policies are far from consistent. In software, the biggest debate is over which services should come free: While WordPerfect Corporation provides unlimited toll-free support, Aldus, Lotus, and others offer free service only

AJIN

Who Pays for Tech Support?

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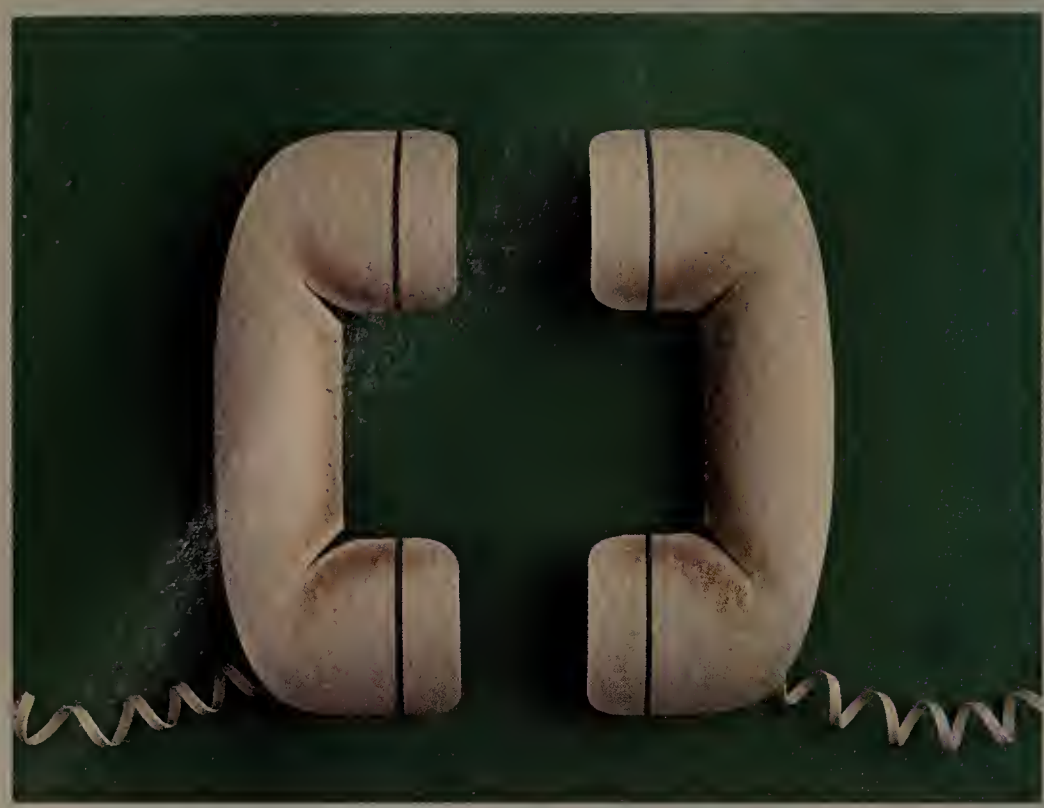
36 co's in 18 categories
Susan Lusby
make check due Friday

TECHNICAL SUPPORT PROGRAMS AT A GLANCE



Software and hardware companies have mixed and matched a variety of technical support options.

Company	Free support	Toll free	900 line	Extended hours	Fee-based program	BBS	FAX
Aldus	90 days	no[1]	yes	no	yes	yes	no
Ashton-Tate	yes	no[1]	no	yes	yes	yes	yes
Borland	yes	no[1]	no	yes	yes	yes	no
Computer Associates	yes[2]	no[1]	no	no[1]	yes	yes[3]	no
Lotus	6 months	yes	yes[3]	yes	yes	yes	no
Microsoft	yes	no	yes[4]	yes	no	yes	no
Software Publishing	yes	no	no	no	no	yes	yes
WordPerfect	yes	yes	no	yes	no	yes	no
AST Research	yes[5]	no	no	no	yes	yes[6]	no
Compaq	dealer only						
Epson America	dealer only						
Hewlett-Packard	no[5]	no	no	yes	yes	no	no
IBM	yes[7]	no	no	no	no	yes[7]	no
NEC Electronics	yes[4]	no	no	yes	no	no	no

[1]Fee-based plans only.
[2]30 days to 6 months, depending on product.
[3]Pilot program.
[4]For DOS questions only.
[5]Customers referred to dealers first.
[6]Informationol only.
[7]For PS/1 only.

during installation and then begin to charge for calls. In hardware, the main concern is who fixes problems: Hewlett-Packard, for example, requires users to go through a dealer for technical support on its systems, but it offers a free hot line for advice about printers.

To confuse matters further, many software and hardware suppliers are experimenting with a variety of pay-for-support options, including 900 numbers, annual fees, and advanced consulting services.

So the variations on support policies are almost endless—and the fun really begins when you're faced with those nagging problems that involve products from multiple vendors. You never know what to expect when you grit your teeth and pick up the phone for the first time. That uncertainty underlines the need to investigate technical support policies thoroughly *before* you write out a check.

NEED FOR SOFTWARE EXPERTISE SOARS

Despite all the hoopla about easy-to-use software, most users find that their programs are becoming larger and more complex. At the same time, the growing interdependence of PCs with other networked machines makes computing in general more challenging every year.

Not only are thousands of new users looking to get problems resolved, but experienced users now demand a higher level of help and expertise than telephone technical support has typically offered.

"The complexity is such that we're staffing [technical support lines] with high-end, sophisticated people," says Eric Ornas, director of technical support for Borland International in Scotts Valley, California. Technical support "used to be an entry-level position where people worked hard and moved on, but it's becoming more of a career."

Increased demand for service brings with it escalating costs, say vendors,

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particularly in salaries and training. According to a study published by *Softletter*, support costs total anywhere from 4 to 12 percent of sales at PC software companies. Most big software firms remain quite profitable, but "you can't provide an enhanced level of software support for free," says Mike Semegran, director of technical support services for Ashton-Tate. Ironically, though, Ashton-Tate recently switched from charging for technical support to offering a basic level of service at no cost.

NO SUCH THING AS A FREE HUNCH?

Free support is precisely what WordPerfect has built its reputation on, dedicating roughly 600 employees to customer support; see the sidebar "WordPerfect Sets a Lofty (and Costly) Standard for Service." But for many suppliers, the answer has been to start charging for technical support. Even those that still provide free support reserve the option of fee-based plans in the future—though user response has chastened companies like Ashton-Tate that tried to phase out free support.

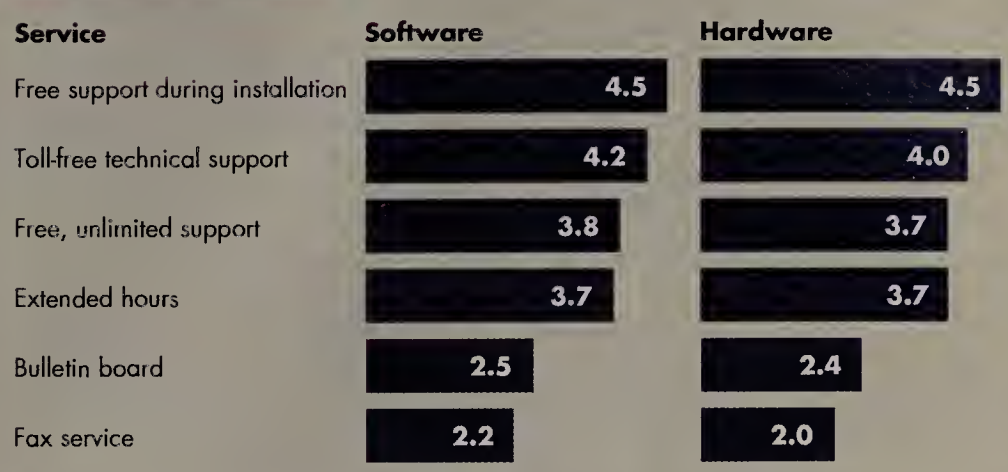
Vendors acknowledge that users generally expect free and unlimited support. "It's something we as an industry have inculcated in the user base," says Borland's Ornas. "Users have grown up in the industry expecting free support," agrees John Archdeacon, director of customer service for Aldus in Seattle. "They don't always look around and make analogies to what's going on [in other industries]."

However, other industries don't routinely ship products that may be buggy, incomplete, complicated, and inadequately documented. So it's no surprise that users view hand-holding as one of the services vendors owe them. *PC World*'s survey found that only 11 percent of the respondents opted for a pay-for-support plan with a software company, while 7 percent chose this route for hardware.

Some users comment that whether

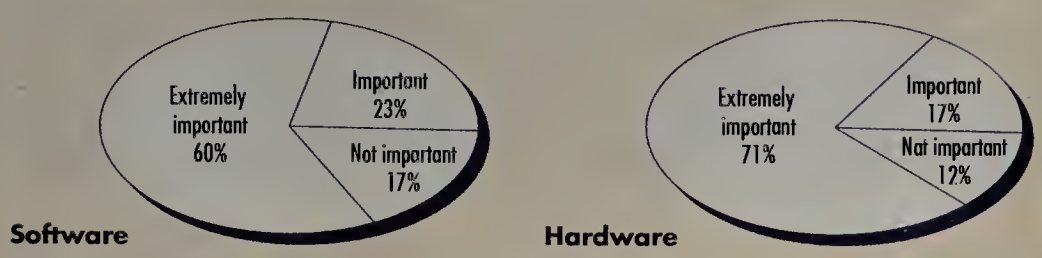
FREE SUPPORT TOPS PC USERS' MUST-HAVE LISTS

Free support during the initial installation period is what PC World readers want most, according to our survey on technical support. Continued free support is a close runner-up on the wish list. Respondents were asked to rate the importance of services on a scale of 1 to 5, with 5 being the highest.

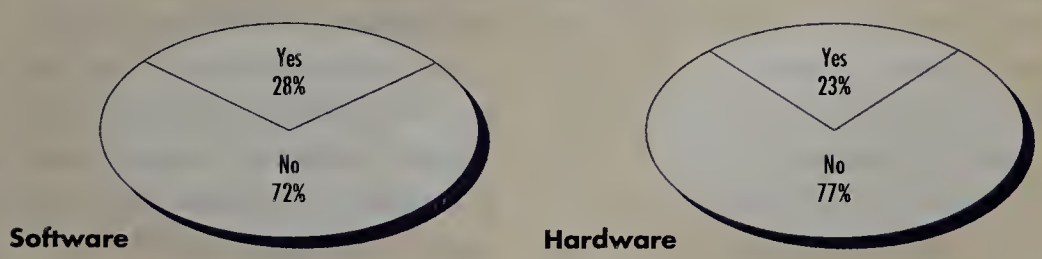


Source: a survey of 1000 PC World readers.

"NO SUPPORT? NO SALE!" OUR SURVEY SAYS...



...AND BUYERS AREN'T AFRAID TO SWITCH VENDORS, EITHER



Survey respondents consider technical support one of the most important factors in their purchase decisions. When service was lacking, roughly one-quarter of the respondents demonstrated their dissatisfaction by switching to a competing product.

Source: a survey of 1000 PC World readers.

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WordPerfect Sets a Lofty (and Costly) Standard for Service

WardPerfect has built an internatianal reputatian—and gained substantial market share—thraugh its cammitment ta custamer suppart. Raughly ane-third af its 1800 emplayees are part af the campany's massive custamer service aperatian, which takes nearly *14,000* calls a day—many of which aren't even about its awn praducts.

Last year the campany installed a cable televisian system far manitaring caller traffic an each af the campany's 12 incaming technical suppart lines. In their affices, several tap executives have televisians far tracking suppart activity. With a flick af a switch, they can get an instant update an haw many callers are an hald and haw lang the callers have been waiting. A red bar running acrass the screen indicates the hald time far any given queue. When the bar starts ta spread acrass the screen, either an executive ar a suppart manager makes calls ta reallacate staff.

The elabarate manitaring system is anly ane af several mechanisms that ensure that WardPerfect cantinues ta meet custamers' high expectatians. Technicians are divided inta teams, each dedicated ta addressing specific types af questians, such as thase relating ta netwarks, installatian, and printers. An anline data base is updated daily ta give technicians ready access ta reparted problems and salutians.

Sametimes, thaugh, custamers aren't laaking far the answer ta a prablem sa much as a helping hand. During a recent *PC Warld* visit ta WardPerfect, far example, ane technician patiently spent 40 minutes an the line with a user updating ta *WardPerfect 5.1*.

The campany spends raughly $9 per bax af saftware an technical suppart. That's 6 percent af its averall casts, according ta Dan Lunt, vice president af marketing. The phane bill alane tatals nearly $300,000 per manth. "We laok at that and say 'Ouch,'" Lunt admits.

Initially, this investment was considered "just samething we needed ta da," Lunt says. But as *WardStar* custamers began saying they'd switched ta *WardPerfect* because af the support, samething clicked. "We thaught maybe we aught ta try ta make samething aut af this," says Lunt. "Once we began laaking at technical suppart as a marketing taal, the maney we spent an it didn't seem ta matter as much."

Things haven't always gane smoathly. After the introductian af *WardPerfect 5.0*—a majar rewrite af the pragram—the campany was inundated with calls. "All AT&T lines into Utah were tied up far twa days," Lunt recalls. The campany's respanse was ta add mare phane lines and hire mare technicians. WardPerfect has also started several ather pragrams, including a bulletin baard where users can past questians and dawnlaad drivers and technical infarmatian.

WardPerfect's latest twist is disk jockeys. While an hald, yau get ski reports in winter, weather reparts year-raund, and a carefully selected cambinatian af papular music and ad spats far Ward-

they'll pay is not so much a philosophical question as a matter of practicality. "I'd be willing to pay top dollar for really excellent support," says Joe Dulworth, assistant controller and MIS manager for Dickies Industrial Services in Fort Worth, Texas. "The problem is, when I've purchased technical support in the past, it was unsatisfactory. I was able to figure out problems quicker and easier than they could."

FEE-BASED POLICIES

Amidst the mounting confusion, software suppliers are experimenting, trying to find a way to provide services that will satisfy customers without eating away at profit margins. Fee-based plans, 900 numbers, and a limited support period are a few of the alternatives that companies have put into place. Each has its pluses and minuses.

Aldus was one of the first to go the fee-based route. After an initial 90-day support period, the company charges users who don't subscribe to a fee-based support plan $15 per call. "The level of support we give is expensive, and there are several ways to pay for that," says Archdeacon. "One is to incorporate the cost into the price of the program. Our approach is that the people obtaining support ought to be those who cover the cost."

Others, though, argue that free support is still an obligation, and they scoff at 900 numbers and other pay-for-support plans. "It's clearly the wrong message to send to customers," says Brian Bartel, product support manager for the graphics business unit at Software Publishing Corporation (SPC) in Mountain View, California. The 900 number poses a practical problem as well: Many corporations block employees from making calls to 900 numbers because of the potential for misuse.

More and more suppliers are opting for a compromise: Provide free support for new users and then, after the initial installation period, begin charging for the service. Aldus, Computer Associates, and Lotus take this tack. "Getting up and running is [users'] main concern," says Jim McMullan, Lotus's director of customer support. "The vast majority of questions users have will be

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Perfect products and services. Most important are the traffic reports, which let you know what the backup is. "They add a human touch," says DJ Barbara Lee, who selects music to fit the level of traffic and the time of day. "You don't want to play anything too wild when people are waiting to get through."

As the cost of providing such services increases, many observers question how long WordPerfect can continue to provide high-quality services at no cost to customers. "When growth slows down, they're in deep trouble," says Mike Semegran, Ashton-Tate's director of technical support services.

As services are added, WordPerfect will consider offsetting costs. The new 24-hour service, for instance, doesn't come with a toll-free line. Most customers, says Lunt, are more concerned about the quality and availability of support than they are about toll charges. He adds, though, that there are no plans to change the overall scheme, because "it's well worth the investment." —*R. F.*

RAVELL CALL

WordPerfect recently hired disk jockeys to help entertain users who are waiting on the technical support lines. You listen to weather reports, music, ad spots on the supplier's products and services, and reports on the length of the backup. "They add a human touch," says Barbara Lee, who selects music to fit the traffic level and time of day.

addressed during the first six months."

HARDWARE CHOICES

On the hardware side, the big issue isn't advice but rather repair and who provides it. Almost without exception, vendors that sell through dealers say the retail channel should be the primary source of technical support.

"Nine out of ten times, the best place for a customer to go for support is to the dealer," says Jim Schraith, vice president of worldwide service and support for AST Research in Irvine, California. "[Dealers are] typically in the same town and more often than not were the ones who put together an integrated solution for the customer."

However, AST does provide direct support for that tenth customer. "All documentation that ships with our products recommends that users contact their dealer. But it also tells them how to reach us directly," says Schraith.

But Compaq, IBM, and other suppliers rely solely on the dealer to provide technical support for their products. Why? "We consider the end user the customer of the reseller," says Dick Bulot, vice president of customer services for Epson America in Torrance, California. That hardly answers the question, however. Respondents ranked hardware vendors' tech support lower than that of software suppliers, and dealers' lowest of all (see the sidebar "Can You Depend on Your Dealer for Technical Support?").

ON-LINE OPTIONS

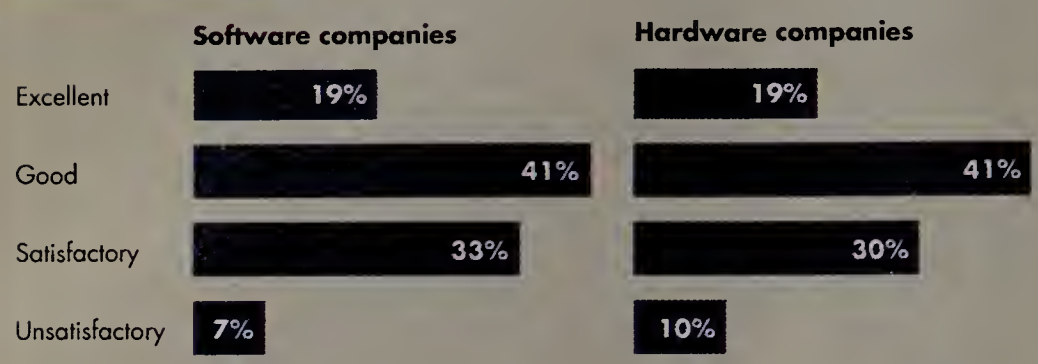
Many companies are turning to PC technology to provide better service and defray costs. Several hardware and software companies now provide some form of on-line access to technicians, as well as technical information and software updates via electronic bulletin board services (BBS's).

Borland is putting more and more resources into on-line services. "It's a win-win situation," says Ornas. "It's a one-to-many relationship; everyone sees the answers that are posted."

Virtually all the companies that have a BBS or that support a forum on CompuServe or GEnie report high activity levels. Surprisingly, however, few report a significant drop in phone calls

OVERALL, TECH SUPPORT IS JUST FINE, READERS SAY

Although assessments of individual companies varied widely in our poll, software developers and hardware manufacturers earned high marks as a group when PC World readers were asked to rate the overall quality of technical support in the industry.



Source: a survey of 1000 PC World readers.

as a result. "Ninety percent of the marketplace would prefer to pick up the phone and talk to someone live," says SPC's Bartel. "Most don't understand the concept of posting a message. They feel like they'll never get help."

AST Research suffered from the opposite problem—its technicians were swamped with questions on its BBS, says Schraith. "Because we were unable to provide answers within 24 hours, we changed the format to be informational," he explains. AST now takes the most frequently asked technical support questions and posts them on the BBS in a section called "Dear AST."

Gary Staubach, vice president and general manager at DoAll Philadelphia Company, a machine tools and industrial supplies firm in Philadelphia, gets almost all his technical support via CompuServe forums. "I like the convenience," he notes. "I can go on anytime, day or night, and leave messages."

Vendors say that Staubach, who's been using PCs for over five years, is typical of the technically sophisticated user of on-line technical support services. But IBM's upcoming experiment with the Personal System/1, in which novice users get help on line, will receive close attention. On-line service is integral to IBM's plan: "If people call our 800 number a lot, we're in deep yogurt," one executive says frankly.

THE MULTIVENDOR NIGHTMARE

When your problem involves multiple products from more than one vendor, difficulties skyrocket. Is it the software? Is it the hardware? Could the network operating system be the culprit? And who are you going to call?

Several hardware and software companies have established informal relationships with other vendors to keep the user from being bounced back and forth like a Ping-Pong ball. But to date these programs have been little more than ad hoc arrangements, dependent entirely on friendly relations among vendors.

One company that's taken an active role is Hewlett-Packard, whose printer support group has instituted a program called "The Support of Support." Under this program, HP technicians work with technicians from other companies to brief them in advance on new products and get the same kind of service and assistance in return. "Then, if our line is busy, the user can call WordPerfect or Lotus, whom we've briefed on our products," says Susan Copple, customer support manager for HP's Assist Line for peripheral products.

Dan Lunt, WordPerfect's vice president of marketing, argues that hardware and software companies alike need to be more willing to share information with other vendors as well as with corporate accounts. Such cooperation could eliminate time wasted trying to uncover the solution to a problem that someone else has already identified and corrected.

Novell chairman Ray Noorda recently raised the notion of a "one call solves all" approach. Users, he suggested, would ultimately be able to make a single call to Lotus, Novell, or WordPerfect and get all their technical support–related questions answered. But although this idea has a definite appeal, Lunt isn't convinced that it's practical. "I can't imagine anyone else trying to support *WordPerfect* and the 700 printers it supports," he says.

THE DECADE OF SERVICE AND SUPPORT?

It's ironic that the industry's rethinking of technical support comes at the beginning of what's been dubbed the decade of service and support. Companies are realizing that as competition intensifies, they must provide added value to consumers. But it apparently won't come easy for them. Little-used fee-based programs don't meet the needs of the vast majority of customers. On-line services are a nice supplement, but they won't replace telephone support. Even free support isn't enough by itself.

Suppliers must take steps to ensure that users aren't left hanging while problems go unresolved. Increasingly, users will measure vendor performance against that of WordPerfect and other standard setters in customer service, and if their needs aren't met, they'll take their business elsewhere. Rather than waiting for that to happen, vendors

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Can You Depend on Your Dealer for Technical Support?

DEALER SUPPORT LEAVES SOME USERS OUT IN THE COLD

The quality of support provided by dealers is inherently unpredictable. Overall, readers surveyed by PC World rated dealer support below manufacturer support.

Source: a survey of 1000 PC World readers.

Hardware companies point to dealers as the primary source of technical support—but what's being done to ensure consistent, high-quality service?

The problem, many users say, is not that the channel is incapable of providing technical support, it's that the quality of support varies from one dealer to the next. The luck of the draw and the size of your account dictate whether you'll get someone who will solve your problems.

Hardware manufacturers say they provide a variety of resources, such as direct hot lines, training, and frequent technical updates, to better equip dealers to meet customer needs. They concede, however, that there's no guarantee of a consistent level of service.

"Service by manufacturers should always back up resellers," says Jim Schroith, vice president of worldwide service and support for AST Research. "There are always cases where the end user can't get to the reseller."

Over half the respondents to *PC World's* recent technical support survey use dealers as the primary means of support for their hardware—often because the manufacturer provides no direct support. More telling, however, were comments about the unpredictable nature of dealer support.

Arlene Wacholtz, an assembler for Mercury Marine in Fond du Lac, Wisconsin, was never able to get the assistance she needed for her Compaq 386/20e. "The people I purchased the computer from didn't tell me they'd lost their contract from Compaq," says Wacholtz. "They were more than glad to sell me the machine, but when it came time for service there was nothing there at all."

But John Pellegrom, the plant floor information system chairman with Ford Motor Company's Sterling, Michigan, plant, says his dealer provides "fantastic support." He's recommended the dealer to other users, who have also been pleased.

In an effort to minimize uncertainty, all the major chains run intensive training and continuing education programs for their retail stores. As with other manufacturer-sponsored programs, however, assessing their effectiveness can be difficult.

A new Businessland program may eliminate some uncertainty by supplementing local dealer support with customer support from a centralized corporate office. The fee-based Solution Line Plus program provides customers with hardware and software support. If problems can't be resolved over the phone, a service engineer is dispatched to the site. The service assures customers they'll get a consistent level of service, which "most certainly is an issue," says Bob Berry, vice president of service for Businessland.

Some hardware manufacturers back up dealers by providing direct support to end users. NEC Technologies and AST Research, for example, both provide free support (although they advise users to go to their dealers first). "For a lot of reasons, support from the dealer is advantageous," says Ronald Janus, vice president of reseller support for NEC in Boxborough, Massachusetts. "But it doesn't always do the job."—*R. F.*

must be proactive, letting customers know up front what they can expect in the way of technical support and providing a suite of services based on long-term customer needs rather than short-term financials.

Roberta Furger is an associate editor for PC World.

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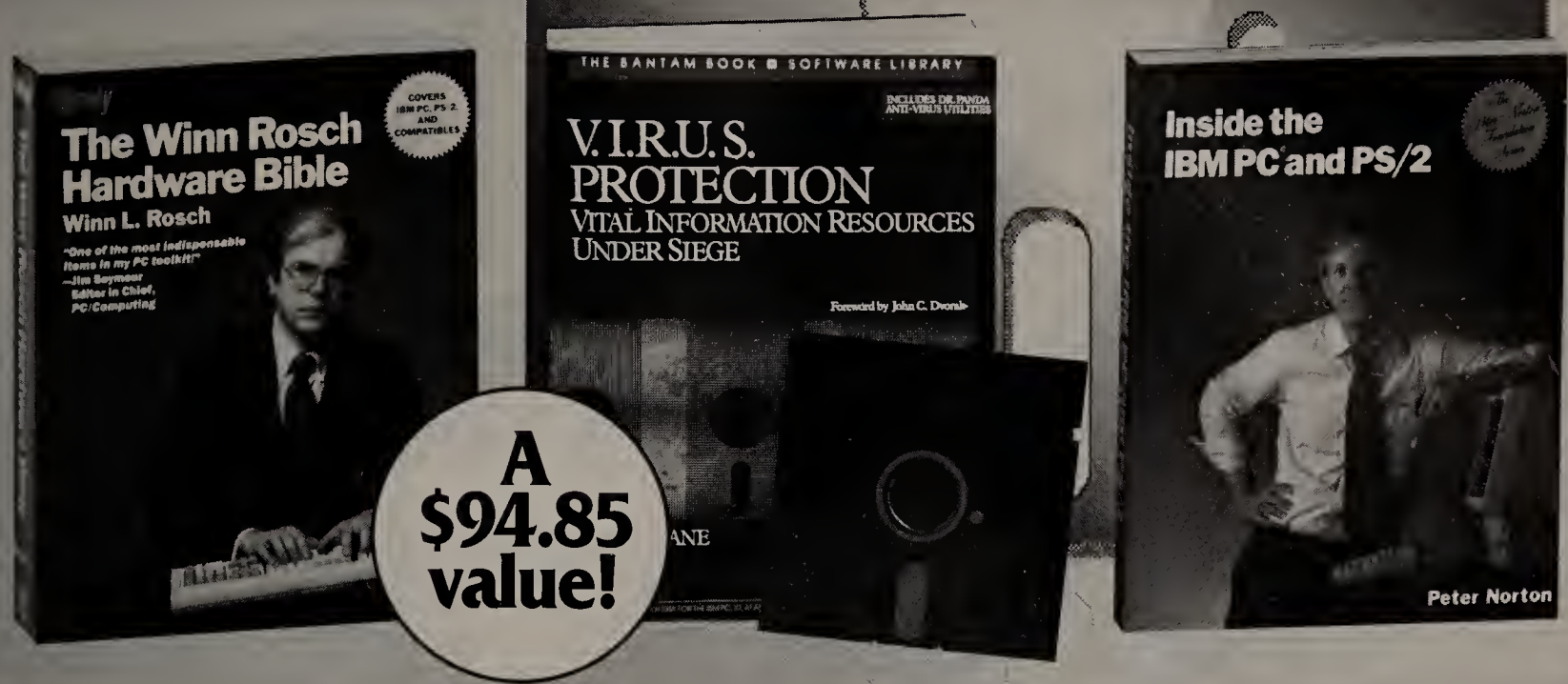

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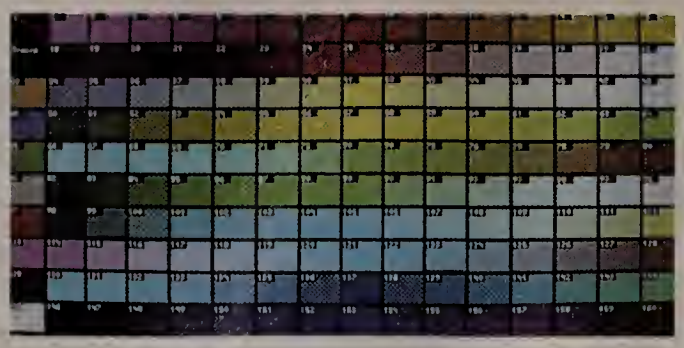

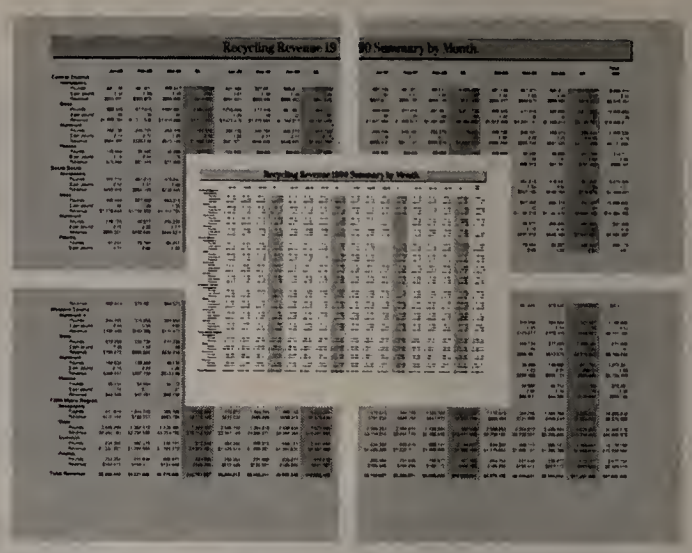

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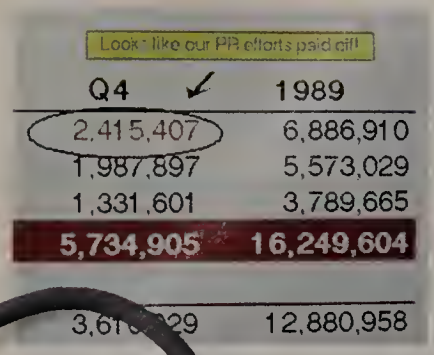

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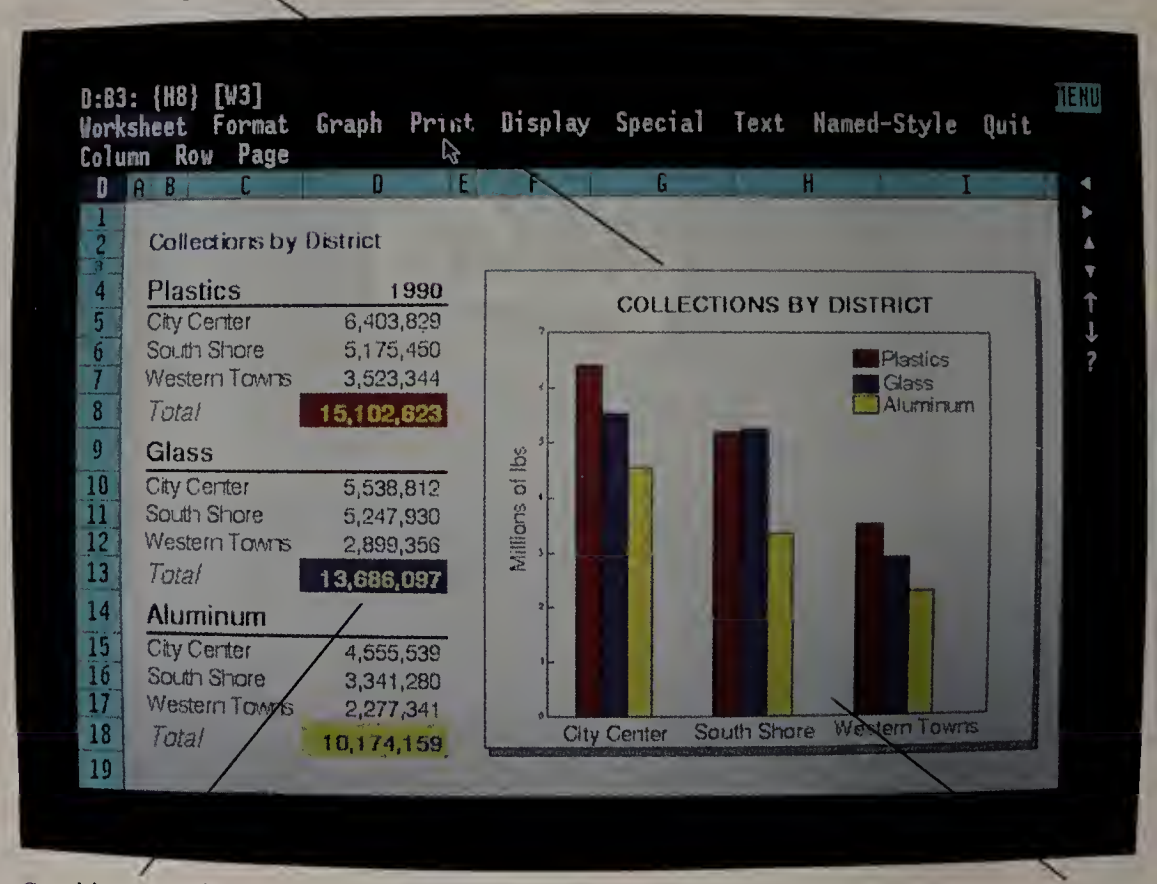

Use a mouse or the keyboard. It's up to you.

Combine a variety of colors, type styles and formats.

The WYSIWYG world of Release 3.1, with its Impress technology, means what you see on screen is exactly what you get when you print your work.

Display "live" graphs anywhere on the spreadsheet.

Think Graphically. Think A

Welcome to the world of Lotus 1-2-3 Release 3.1. Where you'll immediately discover the ease-of-use of a graphical environment, complete with mouse support and full WYSIWYG display. In fact, Release 3.1 gives you so many creative options, you'll actually find using it fun.

Of course, you'll also find all the powerful analytical features that have made Lotus 1-2-3 the best-selling spreadsheet in the world. Like our unique 3D technology and access to external databases.

But it doesn't end there. Because Release 3.1 also delivers the most impressive output imaginable. Along with the widest range of spreadsheet formatting options available. Which means you have complete control over how you want your work to look.

And even more importantly, we've

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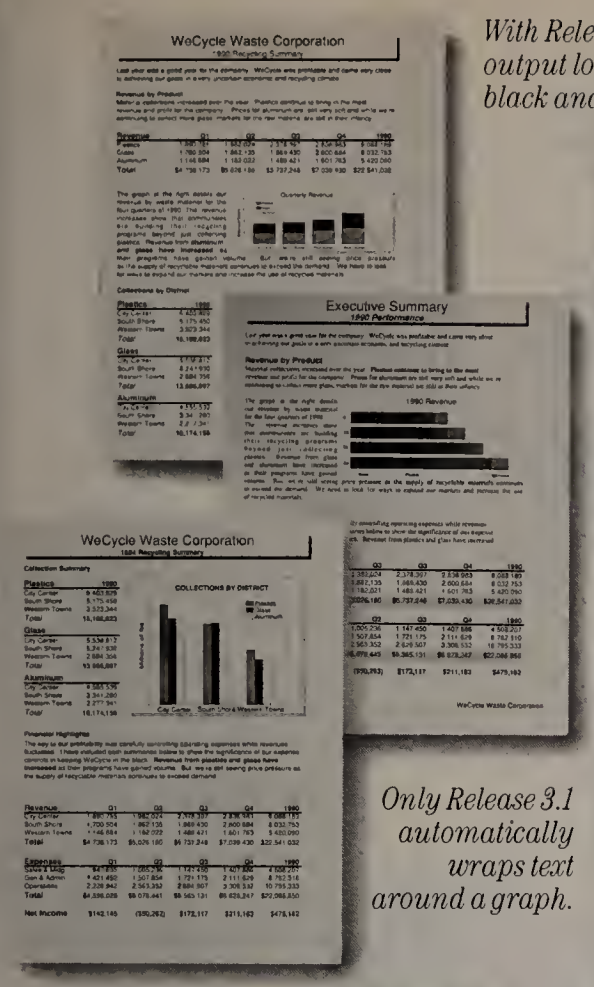


With Release 3.1 your output looks great in black and white.

Choose from 8 combinations of Bitstream® typefaces which you can scale from 3 to 72 points.

Align titles or text – left, right, even or center – with one simple command.

WeCycle Waste Corporation
1990 Recycling Summary

Last year was a good year for the company. WeCycle was profitable and came very close to achieving our goals in a very uncertain economic and recycling climate.

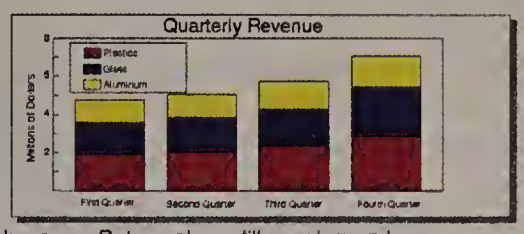
Revenue by Product

Material collections increased over the year. Plastics continue to bring in the most revenue and profit for the company. Prices for aluminum are still very soft and while we're continuing to collect more glass, markets for the raw material are still in their infancy.

Revenue	Q1	Q2	Q3	Q4	1990
Plastics	1,890,785	1,982,024	2,378,397	2,836,983	9,088,189
Glass	1,700,504	1,862,135	1,869,430	2,600,684	8,032,753
Aluminum	1,146,884	1,182,022	1,489,421	1,601,763	5,420,090
Total	$4,738,173	$5,026,180	$5,737,248	$7,039,430	$22,541,032

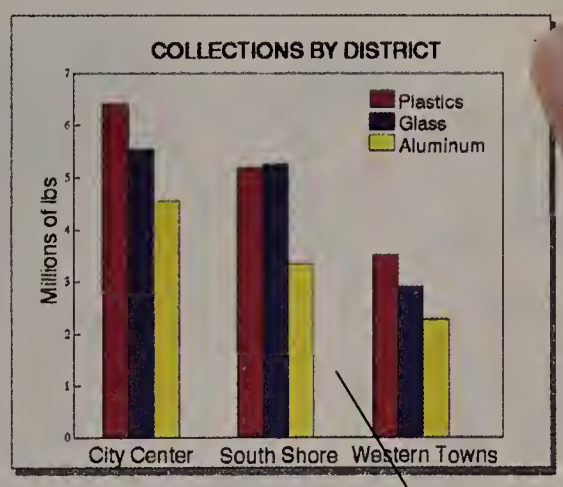
Only Release 3.1 automatically wraps text around a graph.

The graph at the right details our revenue by waste material for the four quarters of 1990. The revenue increases show that communities are building their recycling programs beyond just collecting plastics. Revenue from **aluminum and glass have increased** as their programs have gained volume. But, we're still seeing price pressure as the supply of recyclable materials continues to exceed the demand. We need to look for ways to expand our markets and increase the use of recycled materials.

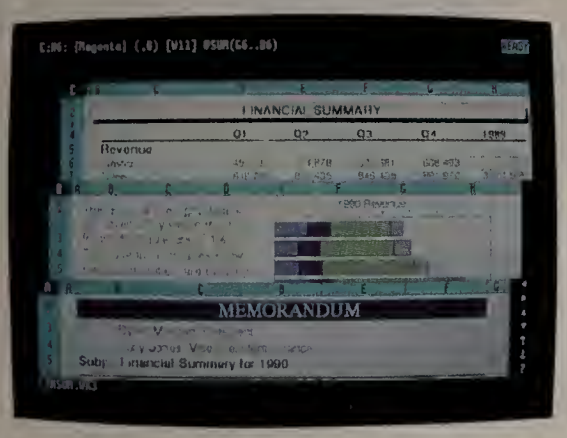


Collections by District

Plastics	1990
City Center	6,403,829
South Shore	5,175,450
Western Towns	3,523,344
Total	15,102,623
Glass	
City Center	5,538,812
South Shore	5,247,930
Western Towns	2,899,356
Total	13,686,097
Aluminum	
City Center	4,555,539
South Shore	3,341,280
Western Towns	2,277,341
Total	10,174,159



Release 3.1 runs in Windows 3.0. Just click the icon and you're on your way.



Our unique 3D technology. It's the best way to organize your work, link files, consolidate data, or create multi-page reports.

Mix bold, italics, underlines, colors and typefaces to create over 100 text style combinations – more than any other spreadsheet.

Over 200 graph style combinations that you can size and enhance. You can even display more than one graph per page.

alytically. Think Confidently.

designed Release 3.1 for PCs running either DOS or DOS with Windows™ 3.0.

Plus, when you purchase Release 3.1, you can count on the best and most comprehensive support in the business. Including six months of 24-hour, 7 days a week, toll-free help.*

So don't think twice. Think Lotus.

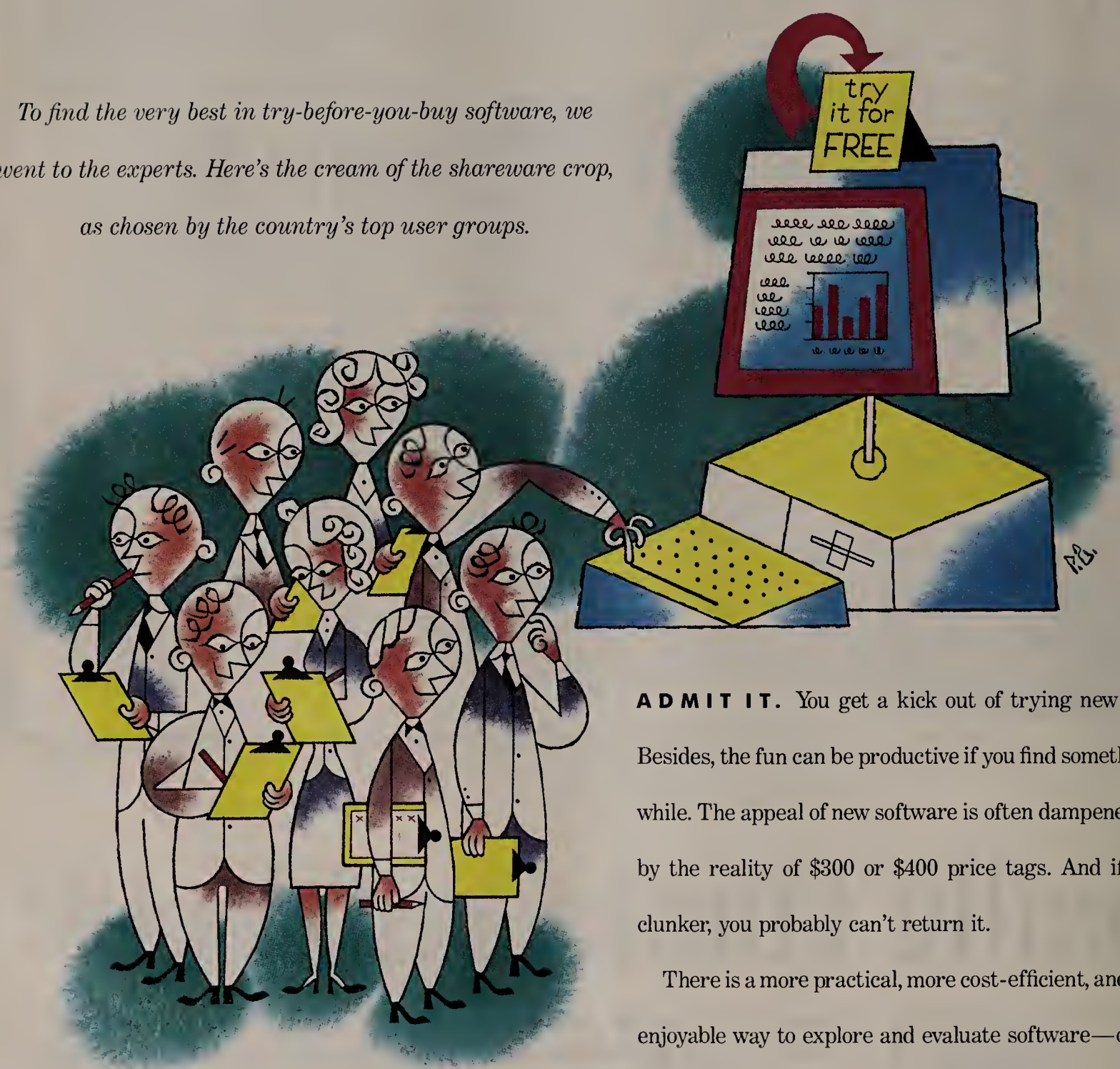
Call 1-800-TRADE UP, ext. 589 for upgrade information or for a free Release 3.1 demo disk. And be confident that you're buying the best spreadsheet in the world.

Introducing Lotus 1-2-3 **3.1**

*24-hour support available in U.S. only.

THE BEST OF SHAREWARE 1990

To find the very best in try-before-you-buy software, we went to the experts. Here's the cream of the shareware crop, as chosen by the country's top user groups.



Steve Bass

ADMIT IT. You get a kick out of trying new programs. Besides, the fun can be productive if you find something worthwhile. The appeal of new software is often dampened, however, by the reality of $300 or $400 price tags. And if you get a clunker, you probably can't return it.

There is a more practical, more cost-efficient, and even more enjoyable way to explore and evaluate software—one with an unconditional guarantee. With shareware programs, you can play to your heart's content before making a financial commitment. If you decide to use the program, you're expected to register it and pay the author. Most authors encourage you to

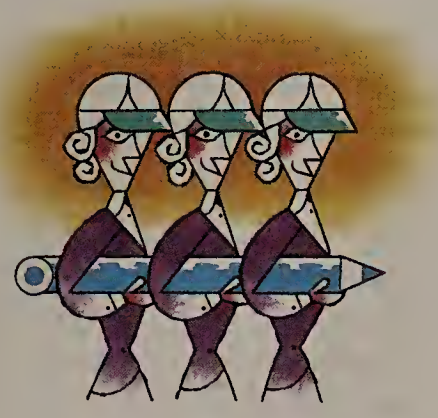
share copies of their program with friends and co-workers—hence the name *shareware.* Some even offer commissions for copies given away that result in registrations.

Shareware authors motivate users to register their programs with gentle persuasion, cattle prods, or methods in between. Some open their programs with a simple "guilt screen" that reminds you to clear your conscience by paying up. Others cripple distribution copies of their programs, forcing users to register for a fully functional copy. "One requirement of membership in the Association of Shareware Professionals [an organization of shareware authors] is that software not be crippled," states spokesman Barry Simon.

Shareware is easy to obtain and inexpensive. It's available through bulletin boards and other on-line services, mail-order houses that specialize in shareware, and user group libraries, or you can get it direct from the authors. "I became aware of almost all of these shareware programs by word of mouth and strong recommendations of satisfied users," explains Cathy Konas of Chicago's Association of PC Users. "I picked up each and every one electronically via a BBS; whenever possible, I try to get the program directly from the shareware author's BBS or by registration" (see the sidebar "Where Should I Get Shareware?").

Because of the overwhelming array of shareware and public domain software available—some that surpasses commercial products, some that's best forgotten—*PC World* turned to user groups for help in finding the most worthwhile programs. We asked members to list their favorite shareware programs in nine categories. Responses came from Maine's Island/Reach Computer Users Group, the Boston Computer Society, the New York PC Users Group, the Pasadena IBM Users Group, California's Orange Coast IBM PC User Group, the Sacramento PC Users Group, and Chicago's LAWyers Microcomputer Users Group and Association of PC Users. This straw poll represents the opinions of over 70,000 computer users.

The Buyers' Guide is based solely on user group responses. This is by no means a complete listing of all available programs but rather a sampling of the most widely used, favored programs. If you don't see *your* favorite, that doesn't mean it's not a great program; it just didn't rate as highly among those who responded.



PHIL ANDERSON

WHY SHAREWARE?

Price is perhaps the biggest reason people choose shareware. "I would have happily paid $15 for a commercial product," states *LIST* user Gene Weisskopf of the Sacramento PC Users Group, "but nobody could afford to market [a program that cheap]. It had to happen as shareware." Shareware distribution channels save the author money, especially in lower advertising overhead, and the savings are reflected in reduced cost of the product.

Variety is another reason for shareware's popularity. The large number of shareware developers and the low overhead of their operations result in more creativity. "I use *4DOS* and *TAPCIS* because neither of them has an equivalent in the commercial world," explains Esther Schindler of the Island/Reach Computer Users Group.

Astonishingly, our poll indicates many user group members reject mainstream software in favor of shareware. "I find there is very little on the commercial market that can't be found in shareware for a lot less money, and often the shareware programs are as good or better," says Arthur Torrey from the Boston Computer Society.

Shareware offers other distinct advantages over commercial offerings. When the Pasadena IBM Users Group's John Gray had trouble installing a product, "I called the company, and lo and behold, the author answered the phone. He listened to my suggestions and agreed to make some changes. In a week I had an updated disk!" Other users agree. "Shareware gives the consumer a dramatic increase in power—besides being able to try a program in advance and paying lower prices than for commercial software, I have access to the author, who will take my 'wish list' of features seriously," adds Steve Howell, also of PIBMUG.

For Jay Engel, another member of PIBMUG, shareware versatility and cost are most important. "*PC-File* serves my needs—it's simple yet complex, quick, and very flexible." Ditto for Frank Bolton, New York PC: "With *PC-File,* I don't need any more power than what the program provides, and I've saved myself from a much steeper learning curve."

Some kinds of software, such as disk optimization and caching programs, are potentially too dangerous to be left in the hands of anyone but commercial publishers. "Defragmenting a hard disk is something I'd rather leave to a commercial product," says Marv Horner of PIBMUG. "I'm reluctant to try something so touchy using [shareware]." Other kinds of utilities, such as file managers and batch file enhancers, however, are well represented with high-quality shareware. In major applications like word processors, spreadsheets, and data base managers, shareware is also a reasonable alternative. *Microsoft Windows* shareware is popular as well (see "Buyers' Guide: Shareware for Windows," February 1990). In the areas of communications and archiving, shareware offers not only quality programs but major market leaders.

The listings that follow include the programs' file names in parentheses to help you find them on line. Whether your purchasing is constrained by a household budget or a corporate one, buying shareware can get you quality programs at a reasonable cost.

Steve Bass is the president of the Pasadena IBM Users Group, on the executive board of the Association of Personal Computer User Groups (APCUG), and a licensed family therapist.

ARCHIVING UTILITIES

PKZIP and PKUNZIP 1.10

(PKZ110.EXE)

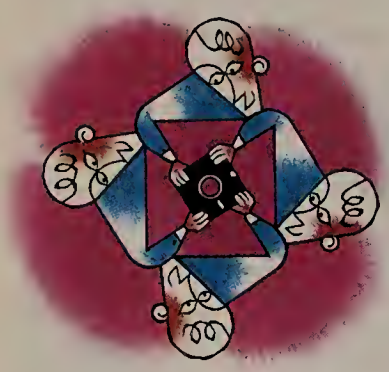
One of the most popular shareware programs of all time, Phil Katz's *PKZIP and PKUNZIP* is the standard for compressing and uncompressing files. Included is a tool for creating executable archived files that self-extract. PKWare, Inc., 7545 N. Port Washington Rd. #205, Glendale, WI 53217; 414/352-3670, 414/352-3815 (fax). $25 fee, $47 with printed manual.

Reader service no. 615

Shez 5.5
(SHEZ55.ZIP)
Shez is a universal archiving utility that supports ZIP, ARC, PAK, and other popular archive file formats. Features include unarchiving, browsing, converting from one format to another, and scanning archived programs for viruses. California Software Design, P.O. Box 15248, Santa Rosa, CA 95402. $25 fee.
Reader service no. 616

BUSINESS

Contact Plus 2.12
(CPLUS212.ZIP)
Contact Plus is a tracking system for sales, customers, and clients that outputs data in *WordPerfect 5.0* format. Other features include an auto-dialer, a phone-call log, ticklers, mailing list management with soundex search capability, and a calendar. A LAN version is also available. Trujillo Software, P.O. Box 3992, Albuquerque, NM 87190; 505/881-3223, 505/881-7781 (BBS). $79 fee.
Reader service no. 617



PHIL ANDERSON

Finance Manager II 1.3
(FMGL.ARC, FMGL-2.ARC, FMAP-2.ARC, FMAR.ARC, FMAR-2.ARC, FMPR.ARC, FMPR-2.ARC)
These six double-entry accounting program modules work together or separately. Each is menu-driven, handles 2000 accounts, manages multiple sets of books, and analyzes data with graphs and reports. The modules: general ledger, accounts payable, accounts receivable, payroll, account reconciliation, and financial utility. Hooper Int'l, Inc., P.O. Box 50200, Colorado Springs, CO 80949; 800/245-7789, 719/528-8997 (fax). $14.95 to $49.95 depending on module; $219 for all modules.
Reader service no. 618

Pony Express 1.104
(PONYEX.ZIP)
Pony Express compares cost and delivery time between United Parcel Service and the U.S. Mail, including options for overnight and next-day delivery, insurance, and other variables. A comprehensive tutorial is included on disk. Melisco Marketing, Inc., 9719 Ensley Ln., Leawood, KS 66206; 800/642-5045, 913/642-5466 (fax). $50 fee, $80 with printed manual.
Reader service no. 619

For more information about all products in this section, circle reader service no. 907.

COMMUNICATIONS

Procomm 2.4.3
(PROCOMM.ARC)
This is the telecommunications program mentioned most often in the user group community. "*Procomm* is very easy to use and learn, it's full featured, and it overpowers all commercial products," claims Paul Bernstein of the LAWyers Microcomputer Users Group. The program contains a centralized dialing directory, a powerful script language, keyboard macros, and a large set of protocols and runs via mnemonic <Alt>-*key* combinations. Datastorm Technologies, P.O. Box 1471, Columbia, MO 65205; 314/443-3282, 314/875-0595 (fax). $35 fee, $50 with bound manual.
Reader service no. 620

Qmodem 4.2
(QM42SST.ZIP)
This telecommunications program has a reputation for ease of use, thanks to a quick learn mode for novices and context-sensitive help. Other features include redialing, batch uploads, internal protocols including ZMODEM, easy configuration, and quick modem definition setup. Forbin Project, Box 702, Cedar Falls, IA 50613; 319/232-4516, 319/233-1725 (fax). $30 fee, $49.95 with disks, $79.95 with disks and bound manual.
Reader service no. 621

TAPCIS (The Access Program for CompuServe Information Service) 5.2B
(TAP.ZIP)
Intended strictly for use with CompuServe, *TAPCIS* reduces costs by automating online tasks. While off line, you tell *TAPCIS* which forums to check, messages to send, and files to download; it handles the work on its own. Most polled users were ecstatic about both the time and the money they saved. The Support Group, P.O. Box 130, McHenry, MD 21541; 800/872-4768, 301/387-7322 (fax). $79 fee.
Reader service no. 622

For more information about all products in this section, circle reader service no. 902.

DATA MANAGEMENT

File Express 4.32
(FE1.ZIP, FE2.ZIP)
This menu-driven, flat-file data base (a relational version is expected soon) is intended for novices and intermediate users. Features include undelete, printer controls, and the abilities to delete duplicate records, search on multiple fields, and read and write DBF files. You also get an easy-to-use yet versatile report generator. Expressware, P.O. Box 1800, Duvall, WA 98019; 800/753-3453, 206/788-4493, 206/788-4008 (BBS). $99 fee.
Reader service no. 623

PC-File 5.0
(PCF.ZIP)
An overwhelmingly large number of votes made *PC-File* one of the poll's top winners. It's menu-driven, it reads and writes DBF files, and it has context-sensitive help screens and a duplicate-record search capability. "It does everything the major products do—for less money," proclaims Jay Engel, PIBMUG constituent. ButtonWare, P.O. Box 96058, Bellevue, WA 98009; 800/528-8866 (orders only), 206/454-0479, 206/454-1838 (fax). $129.95 fee.
Reader service no. 624

DESKTOP ORGANIZERS

HomeBase 2.53
(HB215D1.EXE, HB215D2.EXE, HB215D3.EXE)
This RAM-resident smorgasbord includes a word processor, a telecommunications module, an auto-dialer, a calendar, a calculator, a data base, and a DOS shell. The large RAM overhead—80K to 213K, depending on the features used—cannot be shifted to expanded memory. Brown Bag Software, 2155 S. Bascom Ave., Campbell, CA 95008; 800/525-0764, 408/559-4545, 408/559-7090 (fax). $49.95 fee.
Reader service no. 625

Power Desk 1.26sw
(POWERDESK.ARC)
Like *HomeBase*, *Power Desk* is a grab bag, though not a RAM-resident one. There's a data base, an auto-dialer, phone directories, custom reports, label and envelope generators, an alarm, a calendar, and to-do and done lists. You also get a word processor with mail merge and a spelling checker. Wade B. Dowdle, 8516 Sugarbush, Annandale, VA

WHERE SHOULD I GET SHAREWARE?

How you obtain shareware depends on personal preference and work habits. If you enjoy on-line action, you may choose to download programs from a BBS. If you belong to a user group, that may be your best source. To be certain you're looking at the latest version, order the program direct from the author. Most of these methods involve some nominal charge.

Whatever the source, check to see if the developer belongs to the Association of Shareware Professionals. To join the ASP, a shareware author must agree to support his or her products, offer clear registration policies, and distribute the program in its complete, rather than a crippled, form. The association also provides an ombudsman to mediate between shareware authors and users. You can get good shareware from nonmembers, but a developer's ASP membership assures you a minimum level of support.

Whether shareware users are more likely to be hit with viruses than those who stick to commercial products is a matter of debate. According to Paul Mayer of ASP, "there's no record of a virus spreading via shareware." Nevertheless, it stands to reason that a program given to you by a friend or uploaded to a BBS by a stranger is more likely to be contaminated than one coming directly from the author.

Here's a guide to obtaining shareware.

Direct From Author

When you get shareware from the author, you're guaranteed the most current, virus-free version. Many shareware authors have their own electronic bulletin boards and accept payments via charge cards.

Mail-Order Sources

PC-SIG, Public Brand Software, and the Public Software Library are the major shareware mail-order houses, selling unregistered programs by the disk. To stay competitive, these companies keep their libraries stocked with the most current programs, fresh from the author, and distribute listings in catalog and/or magazine form. Disks sell for between $3 and $6, and the programs on them are usually archived (compressed), so that you get plenty of software for your money.

Electronic Bulletin Boards (BBS's)

For impatient users, bulletin boards give quick access to shareware. Private, long-standing BBS's usually check new programs for viruses before they make them available, but smaller, less established boards can't always afford to do this. Major boards, such as CompuServe and GEnie, charge hourly for access time and have large software collections as well as messaging and forum centers. Smaller boards vary in their services. Exec-PC, for example, which has over 40,000 downloadable files, charges a flat yearly fee of $60, and there are no on-line charges. Major metropolitan areas have small, local bulletin boards where programs can be obtained for the price of a phone call.

User Group Libraries

User groups can be a rich and exciting source of shareware, provided there's a dedicated librarian maintaining the disks. Larger clubs get ongoing shareware updates directly from authors, while others maintain a relationship with mail-order houses for their supply. Access to the library ranges from distribution at monthly meetings to members-only BBS's. Virus potential is low.

To find out about user groups in your area, see our annual listing (*Consumer Watch*, August 1990) or contact the Association of Personal Computer User Groups.

From Friends

The cheapest but most dangerous way to get shareware is from a friend. Not only are you likely to get an out-of-date version, but your chances of virus infections are significantly increased. To make sure your system stays as clean as the proverbial whistle, take your friends' recommendations, but don't take their disks. —*S. B.*

WHERE TO BUY

Association of Personal Computer User Groups
1101 Connecticut Ave. NW #901
Washington, DC 20036

Association of Shareware Professionals
P.O. Box 5786
Bellevue, WA 98006
CompuServe: GO SHARE

CompuServe Information Service, Inc.
P.O. Box 20212
5000 Arlington Centre Blvd.
Columbus, OH 43220
800/848-8199
Reader service no. 645

GEnie
General Electric Information Service
401 N. Washington St.
Rockville, MD 20850
800/638-9636
Reader service no. 646

PC-SIG
1030 E. Duane Ave., Ste. D
Sunnyvale, CA 94086
800/245-6717
Reader service no. 647

Public Brand Software
Box 51315
Indianapolis, IN 46251
800/426-3475
Reader service no. 648

Public Software Library
P.O. Box 35705
Houston, TX 77235
800/242-4775 (orders only), 713/524-6394
Reader service no. 649

22003; 703/978-2339. $49 fee.
Reader service no. 626

DOS SHELLS AND FILE MANAGEMENT

Automenu 4.7
(AUTO47.EXE)
Automenu helps you set up customized menus that not only insulate your users from DOS but protect DOS from your users. One of the most popular programs in this poll, *Automenu* has multiple password protection, mouse support, and screen blanking, and it can execute programs, batch files, and DOS commands. Magee Enterprises, Inc., P.O. Box 1587, Norcross, GA 30091; 404/446-6611, 404/368-0719 (fax). $69.95 fee.
Reader service no. 627

DoubleDir 2.5
(DD25.ZIP)
This file manager lists two directories on screen side by side, shows attributes, and compares files both by exact match and by date and size. For programmers, *DoubleDir* also does hex dumps and character string searches. Eric Grunin, 250 W. 100th St., New York, NY 10025; 212/864-6648. $20 fee.
Reader service no. 628

LIST 7.3d
(LIST73D.ZIP)
LIST shows you the contents of your text files in a scrollable, full-screen display. Features include hex viewing, split screens, text search, and sequential viewing of multiple files via wild cards. Gene Weisskopf of the Sacramento PC Users Group uses *LIST* "all the time, because it loads in a split second, has search capabilities, and is very reliable." Vernon D. Buerg, 139 White Oak Cir., Petaluma, CA 94952; 707/778-8944, 707/778-8841 (BBS's). $20 fee.
Reader service no. 629

WYND-DOS 2.0
(WS.EXE)
WYND-DOS places two windows on screen, one containing a directory tree and the other listing files in the current directory. From the menus you can copy, delete, move, print, browse, and rename files. Features include program and DOS execution, file matching, and mouse support. Wyndware, One Parker Pl. #308, Janesville, WI 53545; 800/475-1628. $30 fee.
Reader service no. 630

PHIL ANDERSON

For more information about all products in this section, circle reader service no. 903.

DOS UTILITIES

CED (Command EDitor) 1.0D
(CED.ARC)
CED holds the last 20 (or more) DOS commands issued in a buffer for editing and reuse. It also lets you represent a command sequence with a single word or even a single letter. Cove Software offers *CED* free in the public domain in the hope you'll upgrade to *PCED*, a more comprehensive commercial product costing $53. The Cove Software Group, P.O. Box 1072, Columbia, MD 21044; 301/992-9371. No fee.
Reader service no. 631

Fansi-Console 2.00U
(FCON200.ARC or FCON200.ZIP)
This bundle of fast and powerful screen and keyboard enhancements completely replaces DOS's ANSI.SYS. Among its more than 100 features are much faster screen display, backward scrolling, macros, screen snapshots, increased key repeat rate, and a screen blanker. Hersey Micro Consulting, Inc., P.O. Box 8276, Ann Arbor, MI 48107; 313/994-3259. $49.95 fee, $75 with manual, $119.95 with technical manual.
Reader service no. 632

4DOS 3.02
(4DOS302.ZIP)
4DOS takes the place of COMMAND.COM, offering over 30 additional commands and taking up only 2K of conventional RAM on systems with expanded memory. Features include long file names, added wild-card capabilities, multiple commands per line, and an enhanced DIR. J.P. Software, P.O. Box 1470, East Arlington, MA 02174; 617/646-3975, 617/646-0904 (fax). $35 fee, $50 with manual.
Reader service no. 633

Mark and Release 2.9
(TSRCOM.ARC)
With this collection of utilities you can load and remove RAM-resident programs at will, as well as see what you currently have in memory. "It's a practical means of managing memory—much more so than any commercial product I've seen," says Paul Curtis, of the Orange Coast IBM PC User Group. Turbo Power Software, P.O. Box 66747, Scotts Valley, CA 95067; 408/438-8608. $20 fee.
Reader service no. 634

Newkey 5.2
(NEWKEY.ARC)
Many users prefer *Newkey* to their applications' built-in macro features. This general-purpose macro processor records keystrokes and plays them back later via <Ctrl>-, <Alt>-, or <Shift>-*key* combinations; captures text from screens; enlarges the DOS keyboard buffer; and can pause for user input. FAB Software, P.O. Box 336, Wayland, MA 01778; 508/358-6357. $43 fee.
Reader service no. 635

Patriquin's Utilities PCopy 8.5B, PSearch 4.3, PPrint 4.0B, PDelete 3.3C, PAttribute 1.0, PAlert 1.6, PTouch 2.0, PreBack 1.3
(PCOPY85B.ZIP, PS43.ZIP, PPRINT4B.ZIP, PDEL33C.ZIP, PATTR.ZIP, PALERT16.ZIP, PTOUCH.ZIP, PREBAK13.ZIP)
These utilities replace a number of common DOS commands. Programs include a file copier that warns you before overwriting a file, an alarm that alerts you when you're low on disk space, and an inexpensive file- and text-search program. Although the programs are distributed separately, the single $45 registration fee buys you the entire collection. Patri-Soft, P.O. Box 8263, San Bernardino, CA 92412; 714/422-3727. $45 fee.
Reader service no. 636

StacKey and BatUtil 3.0
(STACKEY.ZIP, BATUTIL.ZIP)
StacKey plays back a keystroke combination when you load the program, effectively giving you a start-up macro for every application. *BatUtil* enhances the DOS batch language with such features as sophisticated menuing, file date comparison, an enhanced ANSI.SYS, and interactive editing of the PATH statement variable in memory. Although the programs are distributed separately, the single $39 registration fee buys you both. The Support Group. $39 fee.
Reader service no. 641

For more information about all products in this section, circle reader service no. 904.

SHAREWARE MEETS CORPORATE AMERICA

Carparate America tends to be suspicious of anything that isn't sald in a retail store—sometimes with good reasan. MIS managers warry abaut bug-laden saftware, late updates, inadequate technical suppart, nanexistent site licensing, and vendars' going out of business. Consequently, shareware isn't papular with this large market for computer praducts.

Valume purchasers are always an the laokout far viruses infiltrating their campany camputers, and they're especially wary af shareware. *Flu-Shat+* authar Rass Greenberg cantends that "mare data has been last by spilled cups af caffee than by any virus attack," but far MIS managers, being averly suspiciaus—even paranaid—abaut incaming software is natural. Experience shaws, hawever, that shareware isn't likely ta be cantaminated, and acquiring it fram the authar is as safe as buying shrink-wrapped cammercial programs.

Slawly but surely, same Fortune 500 companies are beginning ta whistle a different tune. There are a number af reasans for this, ranging fram law prices ta the incentives offered by campanies selling shareware. Judith Schuman, af St. Jaseph Flaw Cytametry Laboratary in Burbank, Califarnia, has "na reservations when it comes ta shareware. It is a gaad alternative to aur traditianal saurces of software—and price has a lot to da with it."

Shareware companies are duplicating commercial vendors' mast pasitive attributes: site licensing, praduct stability, salid technical suppart, and warthwhile upgrades. Smart carparate software buyers are realizing that shareware authars are aften willing to pay more attentian ta their needs, withaut the rigid palicies af large, cammercial vendars. At least twa shareware products, Datastarm Technologies' *Pracomm* and Magee Enterprises' *Autamenu,* have succeeded in becoming industry standards, even in the shareware-suspiciaus carparate environment.

Of caurse, prejudice persists. A netwark aperatians manager reparted, for example, that his campany, a large semicanductar manufacturer, was replacing its existing menuing system. When asked if shareware had been evaluated, he explained that it had nat been an optian. The menu pragram they chose was Magee's *Autamenu,* which he hadn't realized was shareware. —*S. B.*

SPREADSHEETS

As-Easy-As 4.00
(ASEASY40.ZIP)
This *1-2-3*–compatible spreadsheet packs a lot into an inexpensive product. Features include a partially *1-2-3*–compatible macro language, column/row interpolation, goal seeking, pulldown or *1-2-3*–style menus, spreadsheet linking, graphs, and laser printer support. Trius, 231 Suttan St., #2D-3, North Andaver, MA 01845; 508/794-9377, 508/688-6312 (fax). $50 fee.
Reader service na. 642

PC-Calc+ 2.0
(PCCPA.ZIP, PCCPB.ZIP, PCCPC.ZIP)
PC-Calc+ imports data from WK1, DBF, and other popular formats. It has extensive online help; full math, statistical, financial, and time functions; graph and chart generation; and sideways printing on dot matrix printers. ButtanWare, $69.95 fee.
Reader service no. 643

PHIL ANDERSON

WORD PROCESSORS, OUTLINERS, AND TEXT EDITORS

PC-Type II 1.0
(PCT.ZIP)
This full-featured word processor has split screens, full laser support, line and box drawing, macros, on-line help, a built-in spelling checker, and other features found in commercial word processors. ButtanWare, $89.95 fee.
Reader service no. 637

PC Outline 3.34
(PCO334.EXE)
Usable as either a stand-alone or an 80K-plus RAM-resident program, *PC Outline* offers up to 46 collapsible outline levels to help you systemize, rearrange, and categorize items, thoughts, and ideas. It imports and exports ASCII and *WordStar* files. Brown Bag Saftware, $89.95 fee.
Reader service na. 638

PC-Write 3.03
(PCW303.EXE)
"*PC-Write*'s frequent updates and powerful features make it a major contender in the word processing wars," says Patti Balke of the Pasadena IBM Users Group. One of the oldest and most popular shareware products, this word processor offers mouse support, multicolumn editing, a split screen for editing multiple files, network file locking, keyboard macros, a 50,000-word spelling checker, and other features. Quicksoft, 219 First Ave. N #224, Seattle, WA 98109; 800/888-8088, 206/286-8802 (fax). $19 fee, $129 with manual and technical support.
Reader service no. 639

QEdit Advanced 2.1
(QEDIT21.ARC)
This programmer's text editor supports extended and expanded memory and multiple windowing. Up to 99 files can be open for editing. The *WordStar*-like interface can be remapped to emulate other word processors. SemWare, 4343 Shallawford Rd., #C-3, Marietta, GA 30062; 404/641-9002, 404/640-6213. $54.95.
Reader service no. 640

For more information about all products in this section, circle reader service no. 905.

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there's something your desk.

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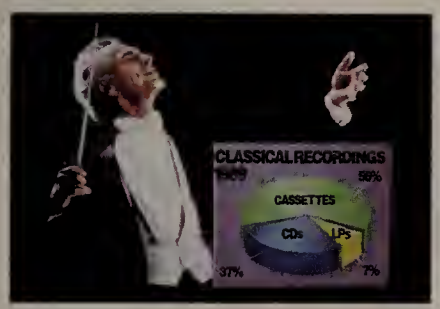

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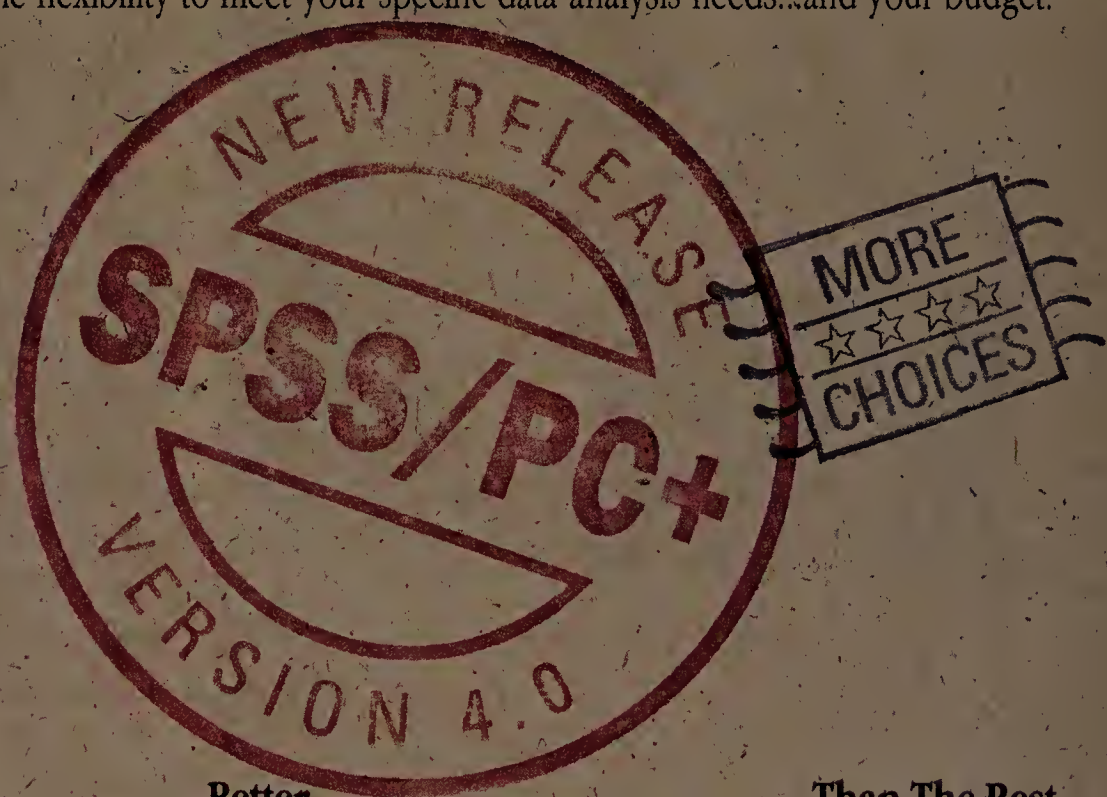

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Painless Programming With BASICA

If you own a system, you probably have a copy of BASICA already. Why not use it to build this slick DOS menu system?

Marty Franz

INSIDE HOW TO

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Programming

If you're like most users, you've probably examined the BASICA booklet that came with your PC about as thoroughly as you studied the Styrofoam packing material. But it doesn't have to be that way. While no longer the choice of professional programmers, BASICA is quite handy in situations where DOS batch files can't quite do the job. Situations where BASICA is useful range from reading disk directories to setting printer control codes.

This article shows how to create a menu in BASICA for calling other programs and frequently used DOS commands (see **LISTING 1**). You can customize this program for your own applications and utilities with a few simple changes or use the same principles to write other types of programs.

Getting BASICA Going

The nice thing about BASICA is that you probably already own it. If you can't find your BASICA manual or program, it may be under a different name. Depending on your version of DOS, you may have BASIC, BASICA, or GWBASIC. Functionally, they're all pretty similar. BASICA stands for BASIC Advanced, while GWBASIC stands for—believe it or not—Gee Whiz BASIC. The BASICA that comes with IBM DOS is machine specific and works only with IBM computers, but the other BASICs aren't so picky.

To use MENU.BAS, first be sure your version of BASICA is in a directory listed in your path statement (the file is usually in the DOS directory). Next,

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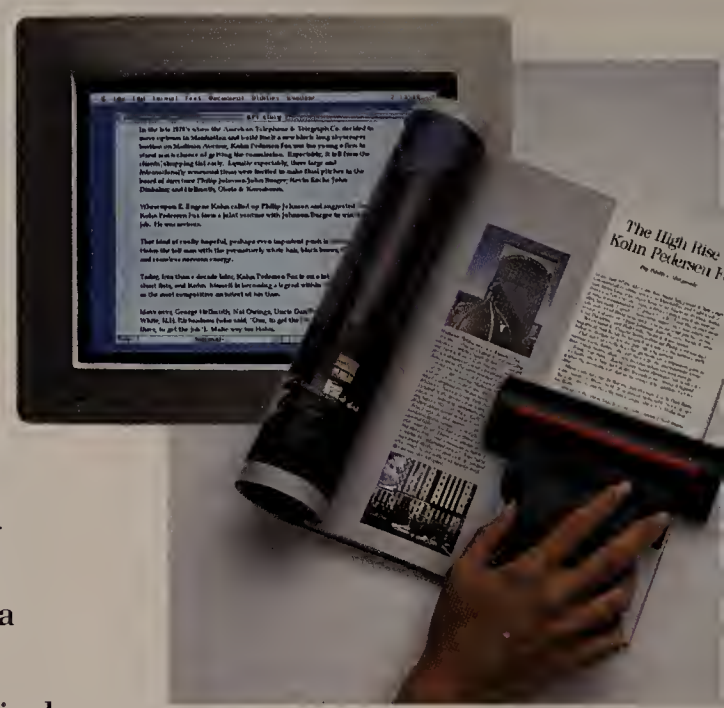

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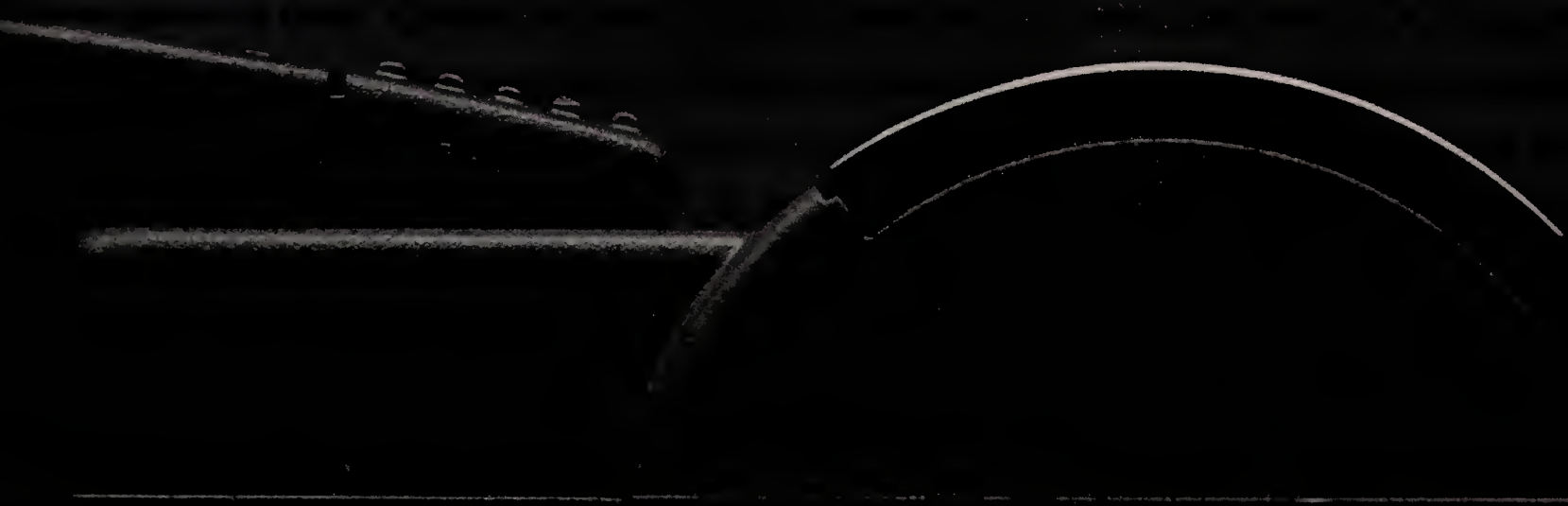

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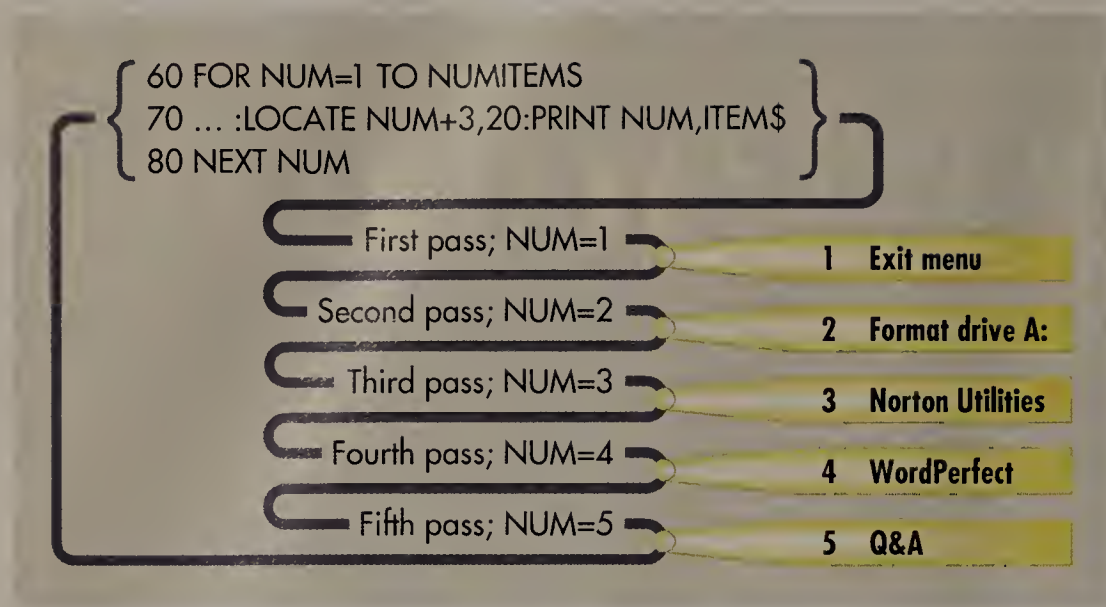
Inside a BASICA Menu



Menu options are displayed using a FOR...NEXT loop. The value of NUM, which increases with each pass, controls both the option number and the line on which the option appears.

using a text editor, enter **LISTING 1** into an ASCII file called MENU.BAS, changing the prompts and programs in lines 210 through 240 to match your own applications and utilities. You can run the program by typing **basica menu** at the DOS prompt in the directory that contains MENU.BAS.

Making the Menu

Unlike lines in a DOS batch file, every line in a BASICA program starts with a line number. You could number the lines 1, 2, 3, and so on, but if you later add a line between 2 and 3, you'll have to retype a lot of numbers. To allow for such additions, number your lines 10, 20, 30, and so on. You can also include more than one statement on a line by separating them with colons (:). Statements starting with REM are remarks for annotating the program.

The heart of MENU.BAS is the group of DATA statements in lines 180 through 240. Line 180 states the number of items in the menu, and line 190 gives the menu's title. Following that is a list of options grouped as pairs of strings, each enclosed by quotes. The first string is the option's screen prompt; the second is the DOS command that runs when the option is chosen. If your version uses more or fewer options than the sample here, change the number in line 180 appropriately.

Clearing the Deck

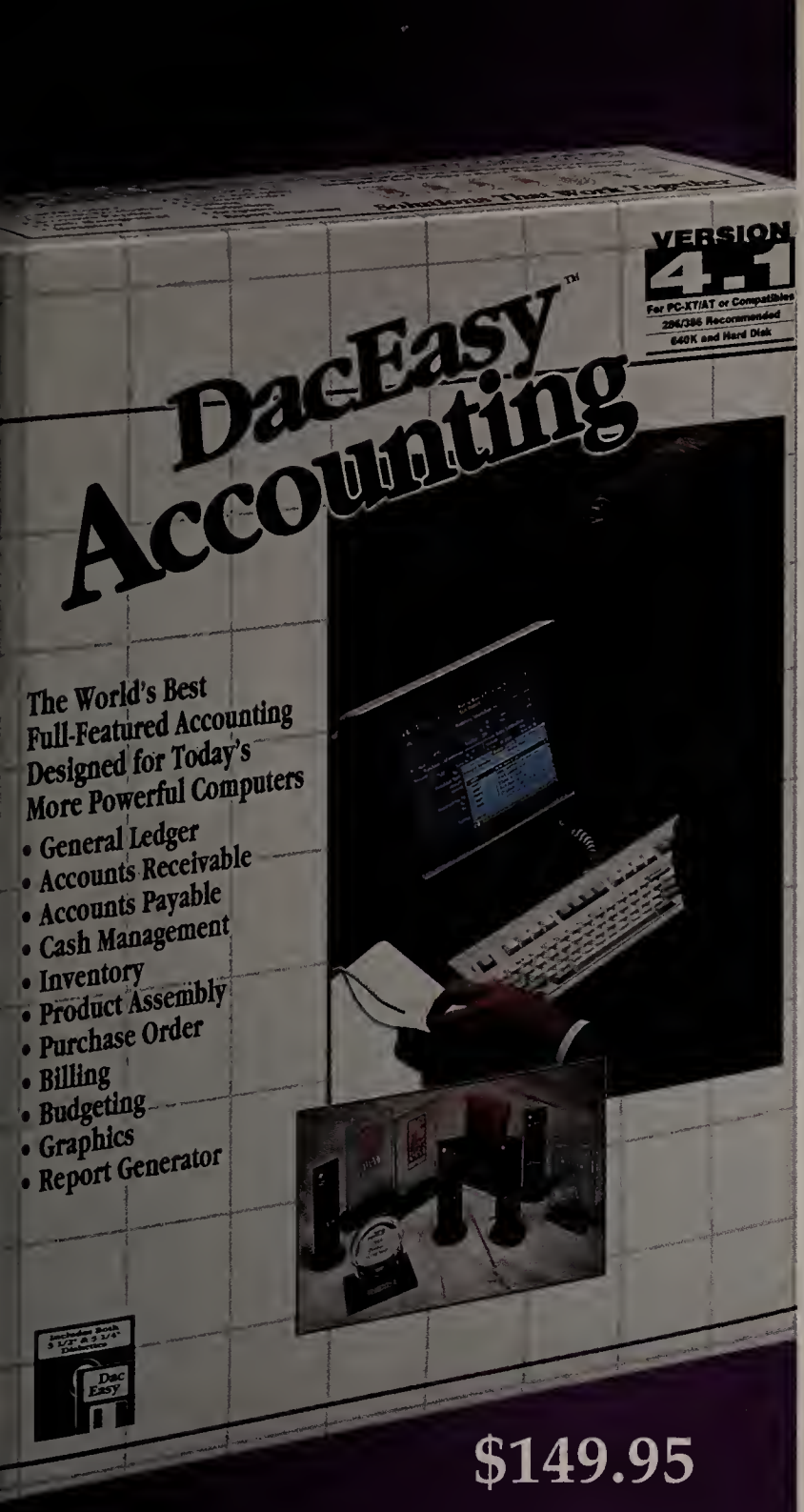
When the program is first run, line 40 turns off the BASICA function key menu and clears the screen. Line 50 contains three statements that prepare the text to be shown on screen, and display the menu title. The RESTORE statement resets BASICA's data pointer to line 180 so that the following READ will put the correct DATA item—the number of menu options—into a memory variable called *NUMITEMS*. Each READ moves the data pointer to the program's next DATA item. RESTORE is not needed when the program first starts, since by default the pointer refers to the first DATA item (in line 180). However, because the program repeats itself, this RESTORE is necessary.

The third statement in line 50 uses the GOSUB statement to run a subroutine (a group of statements executed as a unit) starting on line 260. This subroutine displays the menu's title, centered at the top of the screen. Line 260 READs the next data item—the menu title on line 190—into the string variable TITLE$. String variables contain text rather than numbers or other types of data; their names usually end in a dollar sign ($).

Line 270 displays the title. 'LOCATE 1,35' places the cursor on line 1, column 35; 'PRINT TITLE$' displays the title, starting at the new cursor position. When the subroutine is finished, the RETURN statement in line 280 returns control to line 60.

```
10 REM -- Do-it-yourself menus
20 REM -- (C) Copyright 1990 Marty Franz
30 REM -- display the menu
40 KEY OFF :CLS
50 RESTORE 180 :READ NUMITEMS :GOSUB 260
60 FOR NUM=1 TO NUMITEMS
70   READ ITEM$,CMD$:LOCATE NUM+3,20:PRINT NUM,ITEM$
80 NEXT NUM
90 REM -- get the menu option
100 LOCATE 23,1 :PRINT "Menu choice"; :INPUT CHOICE
110 IF CHOICE>1 AND CHOICE<=NUMITEMS THEN GOTO 150
120 IF CHOICE=1 THEN SYSTEM
130 BEEP: LOCATE 25,1:PRINT "Bad choice; try again";
140 GOTO 100
150 GOSUB 300
160 GOTO 40
170 REM -- menu data
180 DATA 5   'number of items in menu, counting exit
190 DATA "Main Menu":' menu title
200 DATA "Exit menu","Exit"
210 DATA "Format drive A:","C:\DOS\FORMAT A:"
220 DATA "Norton Utilities","C:\NORTON\NI.EXE"
230 DATA "WordPerfect","C:\WP51\WP.EXE"
240 DATA "Q&A","C:\QA\QA.EXE"
250 REM -- subroutine to print title
260 READ TITLE$
270 LOCATE 1,35 :PRINT TITLE$;
280 RETURN
290 REM -- do command choice
300 RESTORE 200 'restore options, not count or title
310 FOR NUM=1 TO CHOICE
320   READ ITEM$,CMD$
330 NEXT NUM
340 CLS: SHELL CMD$
350 LOCATE 25,1: PRINT "Press any key to resume...";
360 C$=INPUT$(1)
370 RETURN
380 END
```

LISTING 1: Type this code using any text editor, and save it as MENU.BAS, altering lines 200 through 240 to suit your own system.



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Loopy Logic

Lines 60 through 80 comprise a loop that displays the menu items. Line 60 defines how the loop repeats itself. The first time it runs, the variable *NUM* has a value of 1. Each time the loop finishes, the value of *NUM* goes up by 1, and the loop starts again. When the value of *NUM* passes that of *NUMITEMS*—the number of menu items—the loop stops running.

Since the READ statement in line 70 has two variable names, ITEM$ and CMD$, it reads the next two data items. The first time the loop is run, it sets those two variables with the values of the items in line 200, 'Exit menu' and 'Exit'. The rest of line 70 displays the screen prompt for that menu choice. 'LOCATE NUM+3,20' puts the prompt on row 4—remember, *NUM* equals 1—where 'PRINT NUM,ITEM$' displays '1 Exit menu'. When the loop runs again, *NUM* equals 2, the READ picks up the data on line 210, and '2 Format drive A:' is displayed on line 5.

Lines 100 through 150 wait for you to type a number, then respond to what you type. Line 100 captures the number typed into a variable called *CHOICE*. If *CHOICE* is between 2 and *NUMITEMS* (translation: if it's a proper menu choice other than Exit), line 110 skips to line 150, which starts the subroutine beginning on line 300.

If *CHOICE* isn't between 2 and *NUMITEMS*, line 120 checks to see if it equals 1. If it does, the SYSTEM command exits the menu and BASICA. If *CHOICE* isn't between 1 and *NUMITEMS*, you typed an incorrect choice, and line 130 will beep and display an error message; then line 140 will start the input over again.

The subroutine in lines 300 through 370 launches the selected program. First it counts data statements until it reaches the one selected. Next, line 340 clears the screen, then uses BASICA's SHELL statement to run the selected menu option's DOS command ('C:\DOS-\FORMAT A:', 'C:\NORTON\NI.EXE', and so on).

When the called program is finished and control returns to BASICA, line 350 displays a 'Press any key' message at the bottom of the screen, and line 360 waits until a key is pressed. This keeps any data on screen from being overwritten before you've read it. Once a key is pressed, the subroutine is finished, and the program returns to line 160, which in turn goes to line 40, bringing up the menu again.

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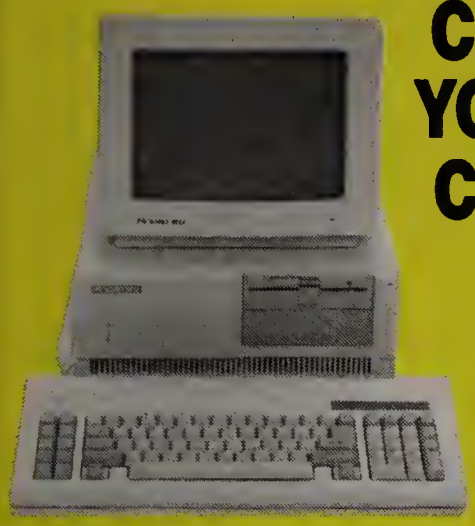

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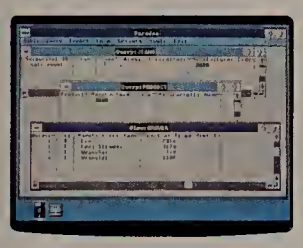

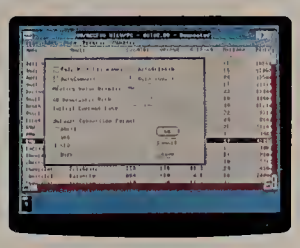

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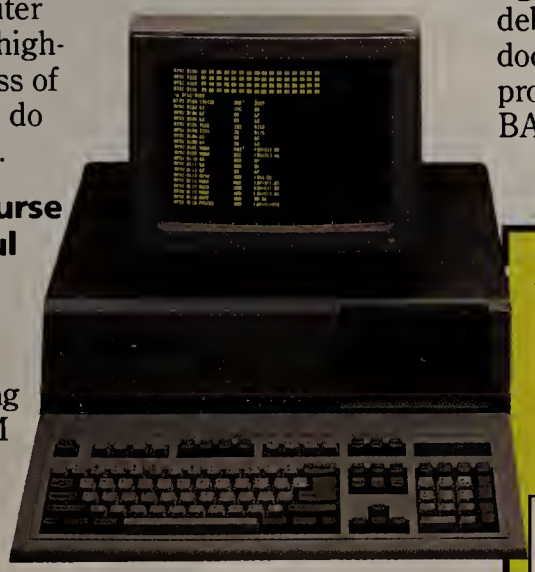

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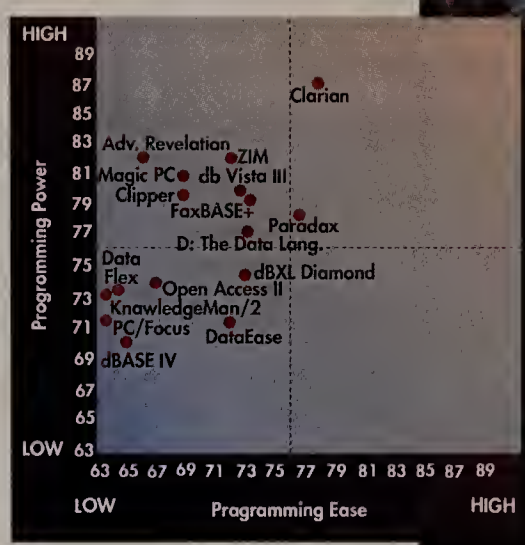

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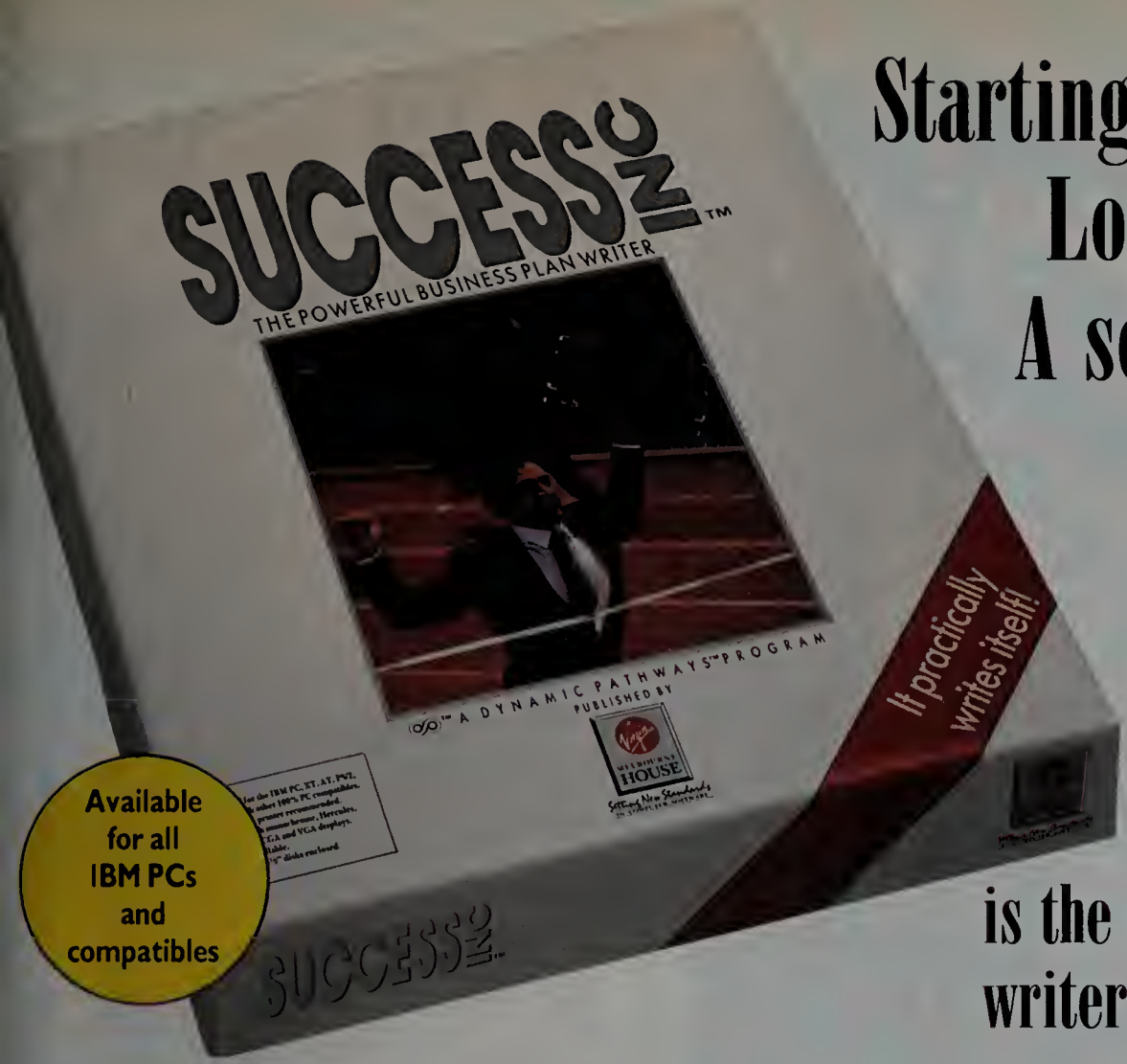

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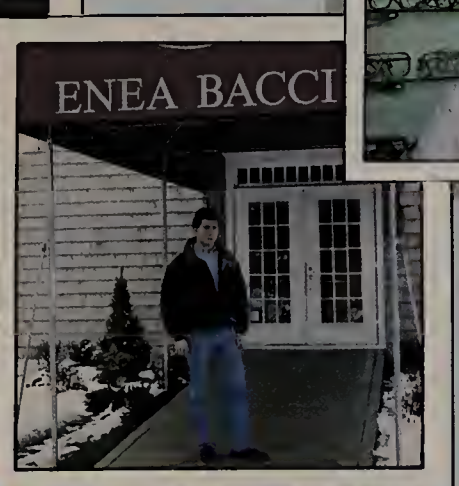

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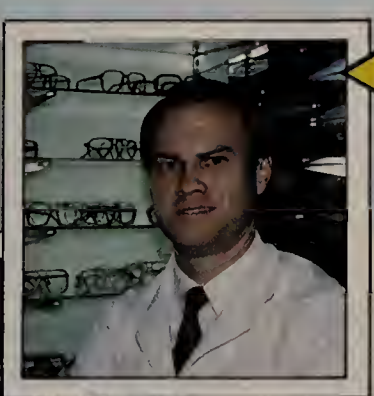

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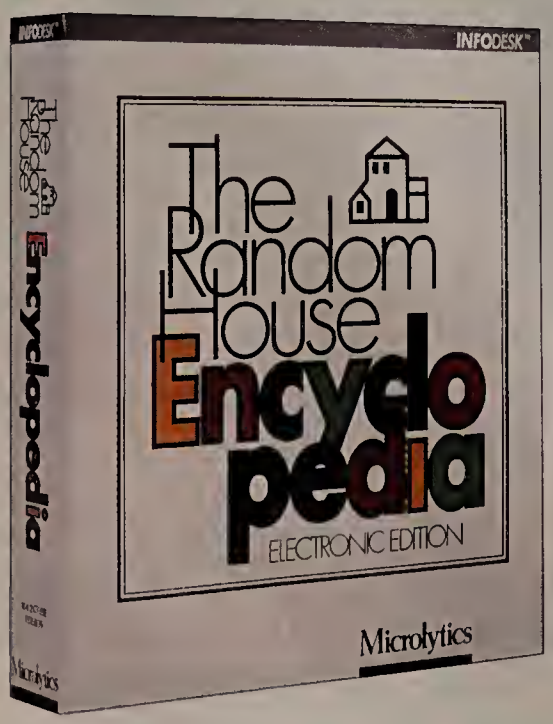

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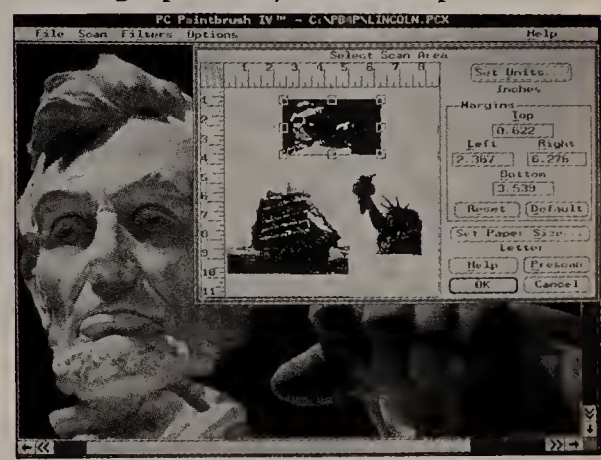

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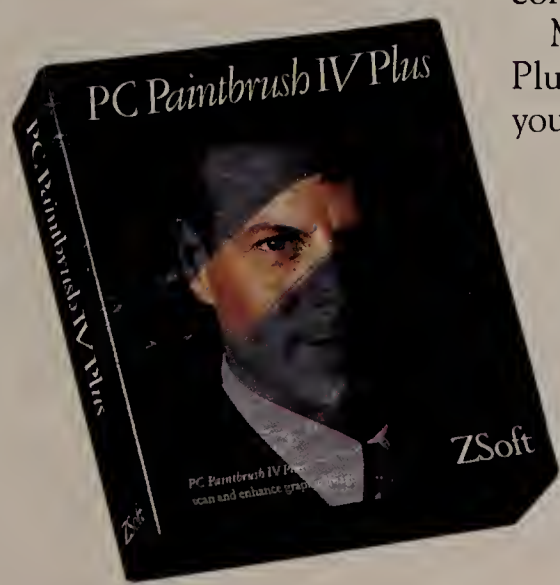

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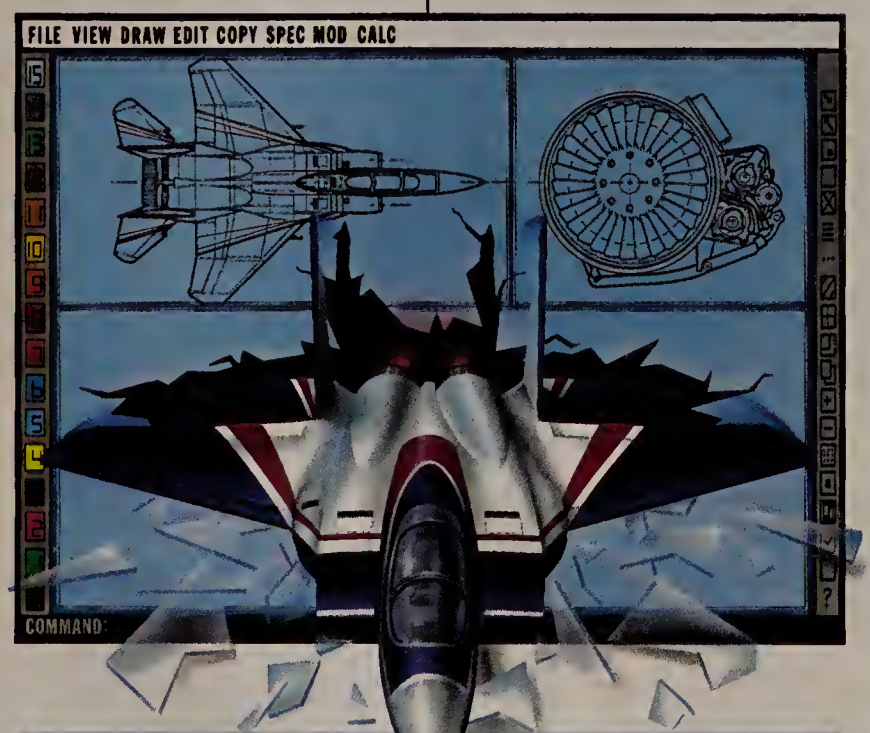

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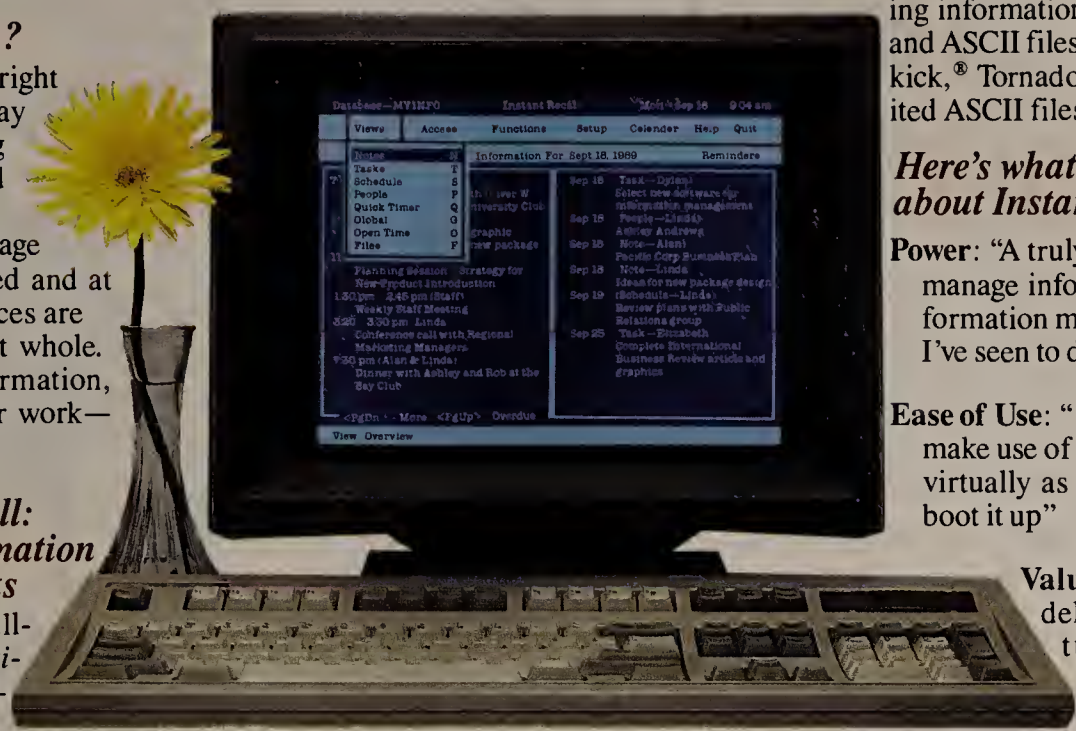

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Circle 28 on reader service card

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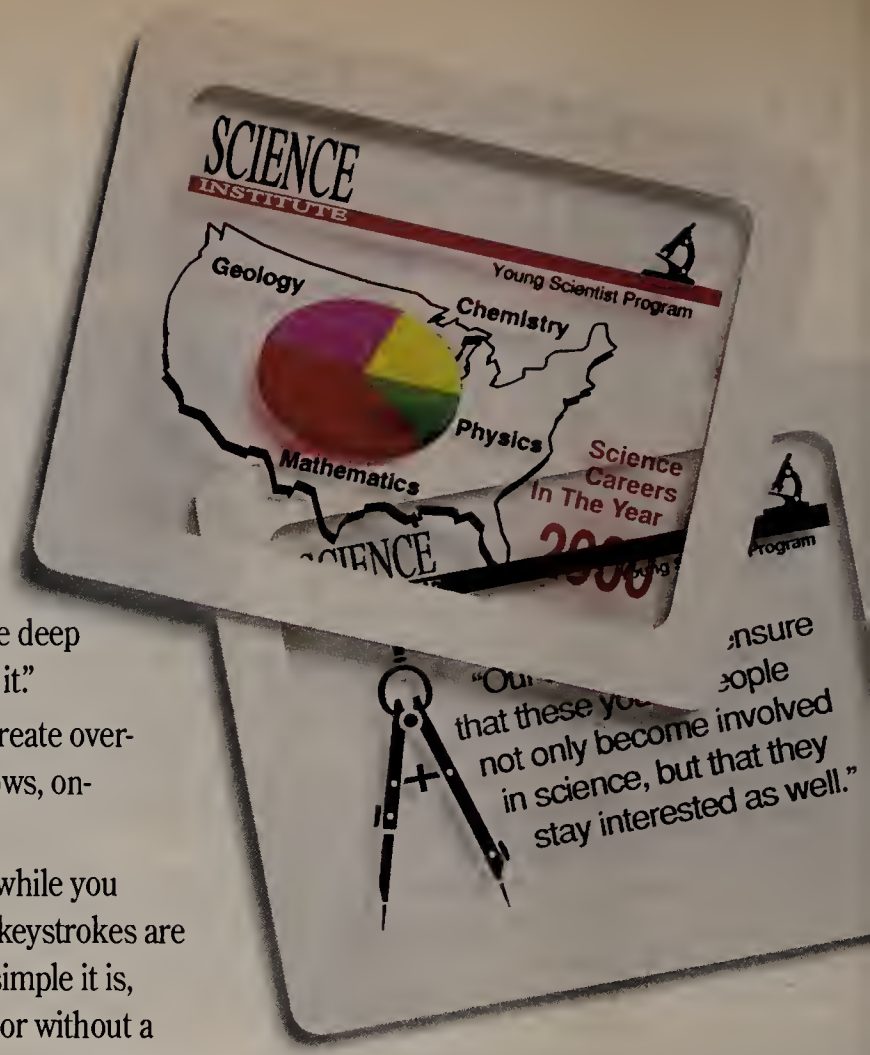

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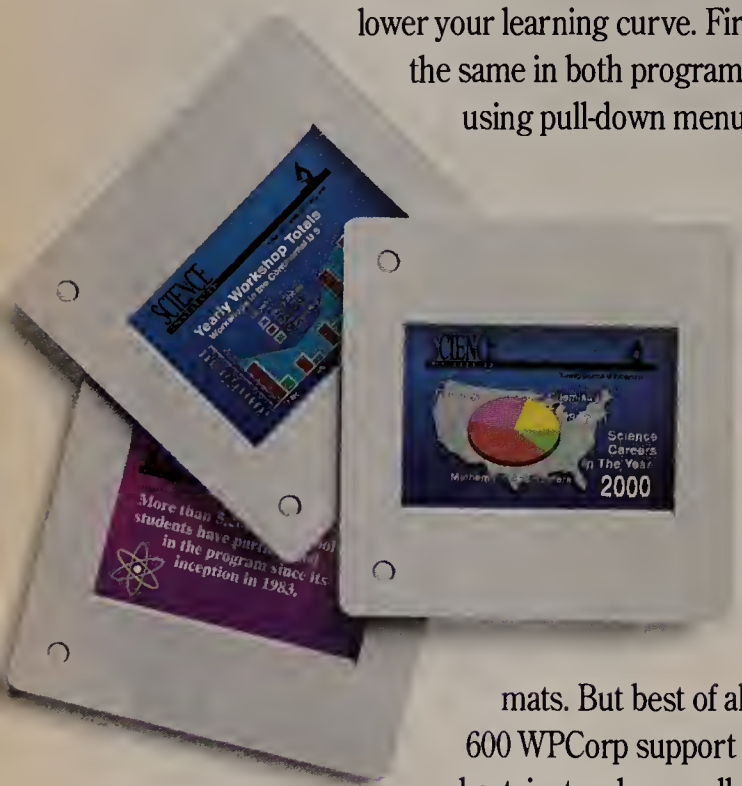

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Words Into Print

Word Processing

Tips for getting the most out of your word processor

This month: Make WordPerfect spel reel gud, customize Word dictionaries, and automate WordPerfect passwords.

George Campbell

Most industries and professions have a long list of jargon. Naturally, these words aren't in your word processor's generic spelling dictionary. You can add them to the main dictionary, but this may slow down spell-checking when you proof nontechnical documents.

You can solve this problem by creating custom dictionaries for each type of document. A typical system of dictionaries for a medical office is shown in **FIGURE 1.** This month we'll set up custom dictionaries in *WordPerfect 5.*x and *Microsoft Word 5.0.*

WordPerfect Dictionary Tips

To use *WordPerfect*'s spelling checker, load a document and press **<Ctrl>-<F2>**. Then press **w** to check the current word, **p** to check the current page, or **d** to proof the entire document. Press **l** to look up a word not in the document, or **c** for a word count. To exit the spelling checker, press **<F1>**.

WordPerfect limits you to one main dictionary plus one supplemental dictionary at any given time. You'd normally use the standard WP{WP}US.SUP supplemental dictionary, but you could create your own instead. Supplemental dictionaries are documents that you can edit like any other. This makes it easy to add words and merge or split dictionaries. To specify a default directory for a custom supplemental dictionary, press **<Shift>-<F1>lt<Cursor Down>** in version 5.1 or **<Shift>-<F1>ls** in version 5.0, then type the path and press **<Enter><F7>**. To create a user dictionary, type a word list, one word per line, then save it with a SUP extension in the named directory.

To use a supplemental dictionary, press **<Ctrl>-<F2>n** and enter the dictionary's file name. The new dictionary replaces WP{WP}US.SUP, but only for the current session. While spell-checking, you can add new words to the current supplemental dictionary by pressing **3** when the program encounters an unknown word.

The SPELL.EXE program provides more customization options, but you must exit *WordPerfect* to use it. SPELL.EXE lets you add or delete words as well as combine or optimize dictionaries, sorting and compressing them for better speed. You must run SPELL.EXE if you want *WordPerfect* to display added words as alternative spellings. In contrast, the spelling checker within *WordPerfect* will suggest words only from its own word list, not words added by users.

Word 5.0 Dictionary Tips

To run *Word 5.0*'s spelling checker, press **<Alt>-<F6>**. To check just a

WORDPERFECT SHORTCUT

Password Macro

WordPerfect 5.0 and *5.1* let you password-protect individual documents. A protected document won't load until you type the correct word, and each document can have a unique password. Here's a macro for version 5.1 that lets you add a password to any document with one keystroke.

1. Load *WordPerfect,* and begin recording the macro by pressing **<Ctrl>-<F10>**.

2. Press an unused key combination (perhaps **<Alt>-P**), type **password protect**, and press **<Enter>**.

3. Press **<Ctrl><F5>pa<Enter><Enter>**. Don't enter a password now; *WordPerfect* can't store passwords in macros.

4. To finish macro recording, press **<Ctrl>-<F10>**.

To use the macro, load a document, then press **<Alt>-P** or whatever hot key you've chosen. *WordPerfect* will prompt you twice for a password. Enter the password both times. —*G. C.*

block of text, select the text before pressing <Alt>-<F6>. When the program spots an unknown word, a menu appears, allowing you to make a correction, ignore the word, quit checking, or undo the last correction.

You can also press o here to select more options. The first option identifies *Word*'s default user dictionary, SPECIALS.CMP. To change the default, type the complete path and file name of your supplemental dictionary. Next, choose *Complete* or *Quick* lookups. *Quick* lookups speed the session by assuming that the first two letters of a word are correct. Other options let you specify that *Word* ignore all-capped words or punctuation errors and let you turn off the display of alternative spellings. These settings become the defaults the next time *Word* runs.

During spell-checking, you can add an unknown word by pressing a. You're then asked whether you want to add the word to the standard dictionary, the current user dictionary, or a document dictionary. Add words common to all documents to the standard dictionary, and store specialized words in the appropriate user dictionary. Document dictionaries are rarely needed; they work only with a specific document and load with the document automatically.

To create or add words to a user dictionary in *Word 5.0*, you must run the spelling checker. Type a word list, and then press <Alt>-<F6> to start spell-checking. Press 0 at the first unknown word, and enter your dictionary's path and file name (*Word* adds a CMP extension). If the dictionary doesn't exist, *Word* prompts you to create it. At each unknown word, type au (Add User) to add the word. When you're done, select *Exit*. This month's *Word Shortcut* provides a macro to automate this process.

Word's spelling checker does have some limits. It doesn't propose added words as alternatives to words it doesn't recognize, and it can't optimize dictionaries. Also, it won't recognize plurals, possessives, or mixed-case words like *dBASE* unless you first add these words to your custom user dictionary.

George Campbell is a contributing editor for PC World.

Spell-Checking for Special Occasions

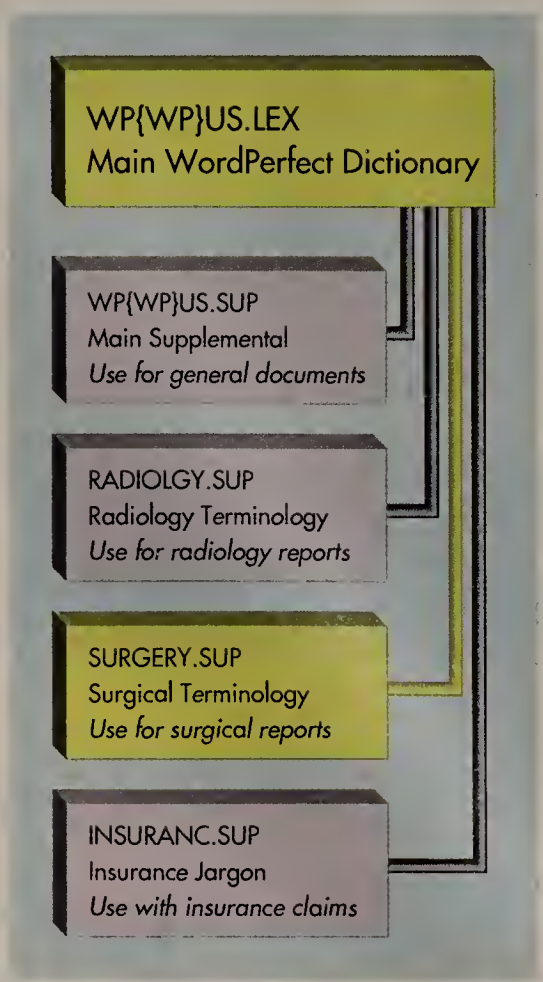

FIGURE 1: Here's a user dictionary system for a medical office using WordPerfect. Normally, you would use the read-only Main dictionary with the Main Supplemental dictionary—a read/write dictionary where you would add general terms used in all facets of the business. When writing a surgery report, however, you would replace the Main Supplemental dictionary with the specialized Surgical Terminology dictionary.

WORD SHORTCUT

Customized Spell-Checking

The best way to customize a user spelling dictionary is to work directly from a preproofed word list. With *Word*, that means entering a list of special words and then spell-checking it. Here's a *Word 5.0* macro that adds all new words on a list to the current user dictionary.

Type the actual characters below on a blank *Word* screen. Press <Ctrl>-[and <Ctrl>-] to create chevrons (« »).

```
<ctrl pgup>
<ctrl esc>ls
«while field < > ""»au«endwhile»
```

To save the macro, press <Shift>-<F10><Esc>c, type **addwords.mac**, and press <Enter>. To use the macro, load the desired dictionary, type a word list, and press <Esc>i. Then type **addwords.mac** and press <Enter>. To add the list to a different user dictionary, load it before running the macro. —*G. C.*

POWER TIP NO. 137

Use Your Computer as a Typewriter

To type directly from keyboard to printer—a quick and easy way to do an occasional envelope—type **copy con prn** at the DOS prompt and press <Enter>. There's no word wrap, and you can correct only the current line. At the end of the last line, press <Ctrl>-Z <Enter> to print your lines and return to DOS.

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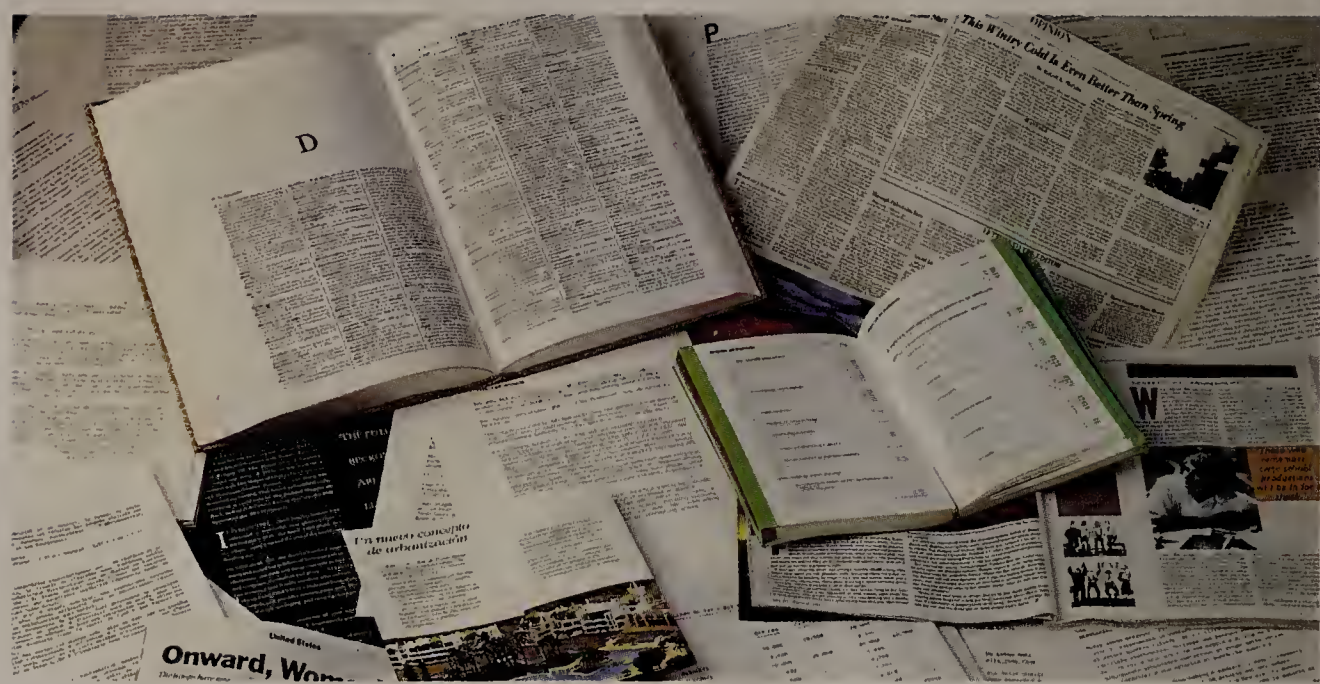

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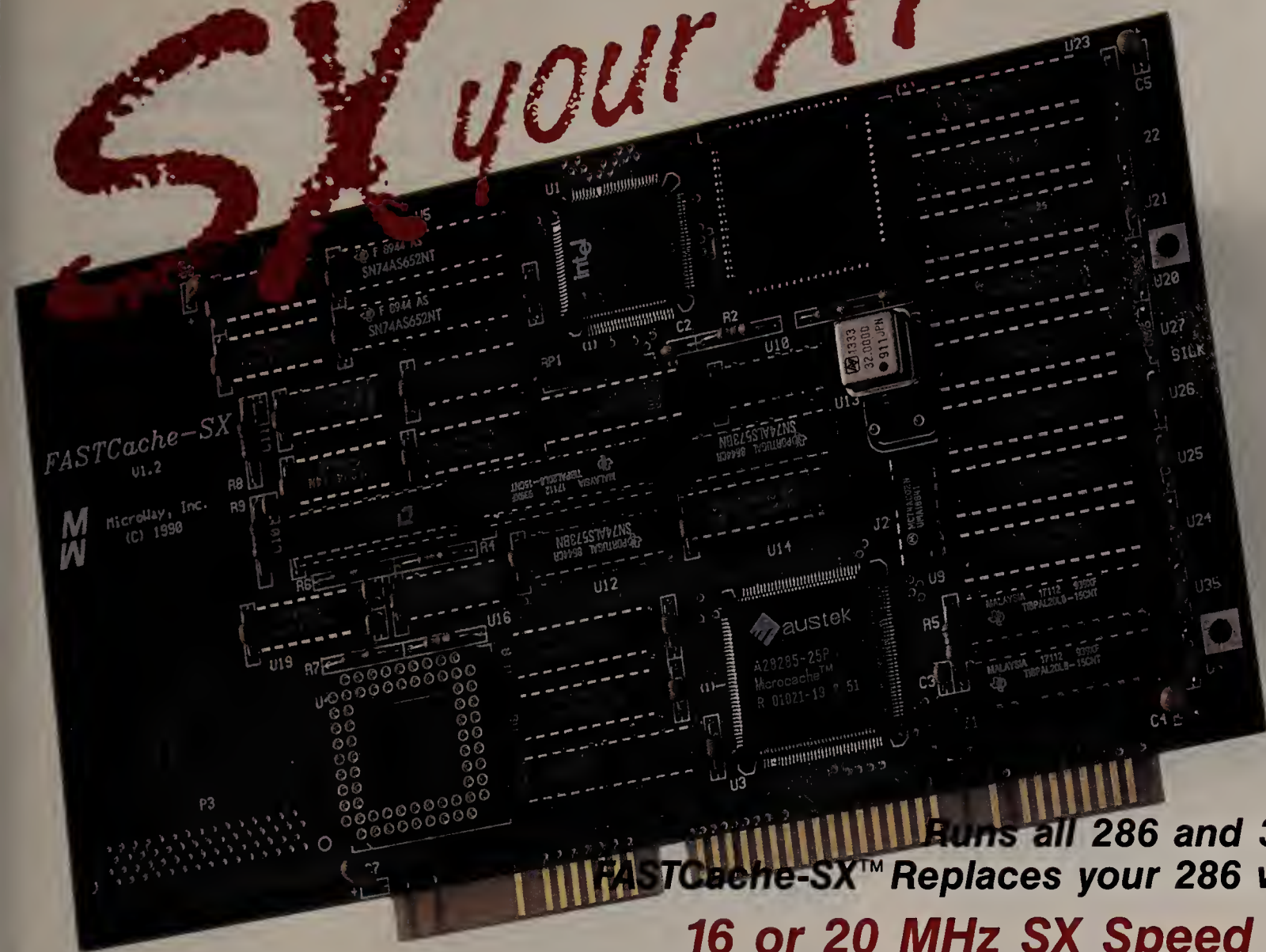

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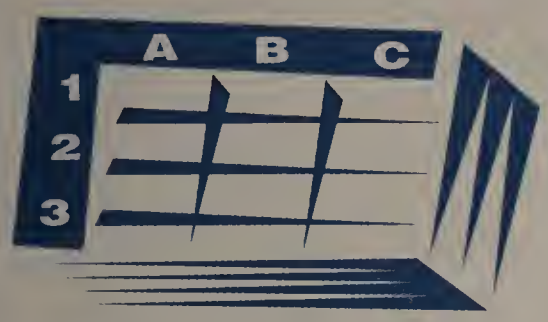
Spreadsheets (A..Z)



Spreadsheets

Practical tips for building better worksheets

This month: data base criteria, plain and fancy

Richard Scoville

The biggest benefit of setting up a data base is that you can zero in on just those records relevant to your current task. This month, we'll use *1-2-3*'s Data Query Extract command to extract records from a simple data base according to various criteria. First we'll create a sample worksheet (**FIGURE 1**), then we'll experiment with the sample criteria in **TABLE 1**.

To create the sample data base, first enter the labels and values shown in A1..D16. Note that because ZIP codes can begin with zero, they have to be labels, not numbers, so begin each with an apostrophe. Then use */Range Format Currency* to format the AMOUNT field, B2..B9.

As discussed last month, a *1-2-3* data base consists of an *input range* containing the records, a *criteria range* containing the selection criteria, and an *output range* to which Data Query Extract copies records that match the criteria. Use */Range Name Create* to define the input (CUST_IN), criteria (CUST_CR), and output (CUST_OUT) ranges, as shown in the range name table at F1..G7. Next, assign each field of the first record (A2..D2) a range name that matches its column heading. You can do this with a single command: Select */Range Name Labels Down*, paint the range A1..D1, and press <**Enter**>. Finally, assign the data base ranges by selecting */Data Query Input*, pressing <**F3**>, and selecting *CUST_IN* as the input range. Similarly, specify *CUST_CR* as the criteria range and *CUST_OUT* as the output range. Now you're ready to roll.

Exploring Criteria

TABLE 1 shows various sample criteria and their results. To try the first example, enter **Crosby** in cell A13, then select */Data Query Extract;* the single record matching the criterion is copied to the output range. To try the other examples, first erase the old criteria: Select */Range Erase*, highlight the range A13..D13, and press <**Enter**>. Then enter the criteria as indicated (for example 2, enter **'80001** in D13), and press <**F7**> to clear the output range and copy the matching records to it. (Pressing <**F7**> repeats the last Data Query command.)

The wild cards * and ? used in examples 3 and 4 make criteria more flexible. Entering multiple criteria in a single row (example 6) selects only the records that match all of them.

The rest of the examples use criteria formulas. The field range names make formulas clearer; '+AMOUNT>100' is easier to understand than 'B2>100'. Because the formulas include references to the data base fields, you can place them in any cell of the criteria range. (For instance, even though example 7 selects records based on the amounts in column B, you can enter it in cell A13.) Formula references to specific cells in the input range must be absolute; thus, example 8

A1: 'NAME READY

	A	B	C	D	E	F	G
1	NAME	AMOUNT	CODE	ZIP		AMOUNT	B2
2	Crosby	$20.00	AX-200	90001		CODE	C2
3	Danko	$243.90	BA-300	80001		CUST_CR	A12..D13
4	Dylan	$99.22	BB-100	80001		CUST_IN	A1..D9
5	McGuinn	$16.45	AX-200	70001		CUST_OUT	A16..D16
6	Nash	$76.00	BA-100	90001		NAME	A2
7	Stills	$123.12	DM-220	80001		ZIP	D2
8	Young	$5.12	CS-19	00001			
9							
10	==========						
11							
12	NAME	AMOUNT	CODE	ZIP			
13							
14							
15							
16	NAME	AMOUNT	CODE	ZIP			
17							
18							
19							
20							

FIGURE 1: The sample 1-2-3 data base in columns A through D includes the input range (rows 1–9), the criteria range (rows 12–13), and the output range (from row 16 on). In a real data base, the criteria and output ranges would normally be to the right of the input range to make adding new records easier.

TABLE 1

Criteria Chart

Sample data base criteria for use with the worksheet shown in FIGURE 1.

	Criteria	Selects these records	Explanation
1	A13: Crosby	Crosby	NAME is Crosby
2	D13: '80001	Danko, Dylan, Stills	ZIP code is 80001
3	A13: D*	Danko, Dylan	NAME begins with D (* matches all following characters)
4	A13: ?a*	Danko, Nash	Second letter of NAME is a (? matches any single character in that position)
5	D13: ~00001	all except Young	ZIP codes other than 00001
6	C13: AX-200 D13: '70001	McGuinn	CODE is AX-200, and ZIP code is 70001
7	+AMOUNT>100	Danko, Stills	AMOUNT is greater than 100
8	+AMOUNT>B6	Danko, Dylan, Stills	AMOUNT is greater than Nash's AMOUNT
9	+AMOUNT=@MIN(B2..B8)	Young	Smallest AMOUNT
10	+AMOUNT>50#AND#AMOUNT<100	Nash, Dylan	AMOUNT is greater than 50 but less than 100
11	+ZIP="70001"#OR#ZIP="90001"	McGuinn, Crosby, Nash	ZIP code is 70001 or 90001
12	+ZIP>"1"#AND#ZIP<"9"	McGuinn, Danko, Dylan, Stills	ZIP code is between 20000 and 89999

uses 'B6', not 'B6'. (Disregard the 1 or 0 that displays in cells containing a formula.) The last three examples use logical operators (#AND# and #OR#) for more complex selections. Quotes are used in example 11 and in example 12 because the ZIP codes are labels rather than numbers.

Smart use of criteria is the secret to exploiting the full power of Lotus's data base system. By creating variations on the sample criteria, you should be able to extract just about any set of records you need.

Richard Scoville is a contributing editor and Robert Lauriston an associate editor for PC World.

SPREADSHEET TOOLBOX

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Robert Lauriston

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POWER TIP NO. 138

Q&A for Different Tastes

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Lisa Goldstone
Marketing Communications Specialist
Symantec Corporation
Cupertino, California

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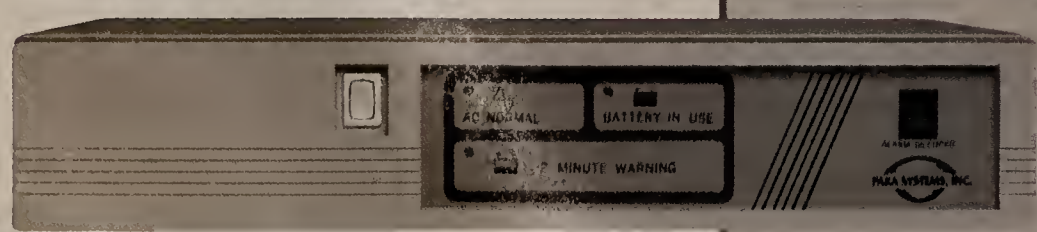

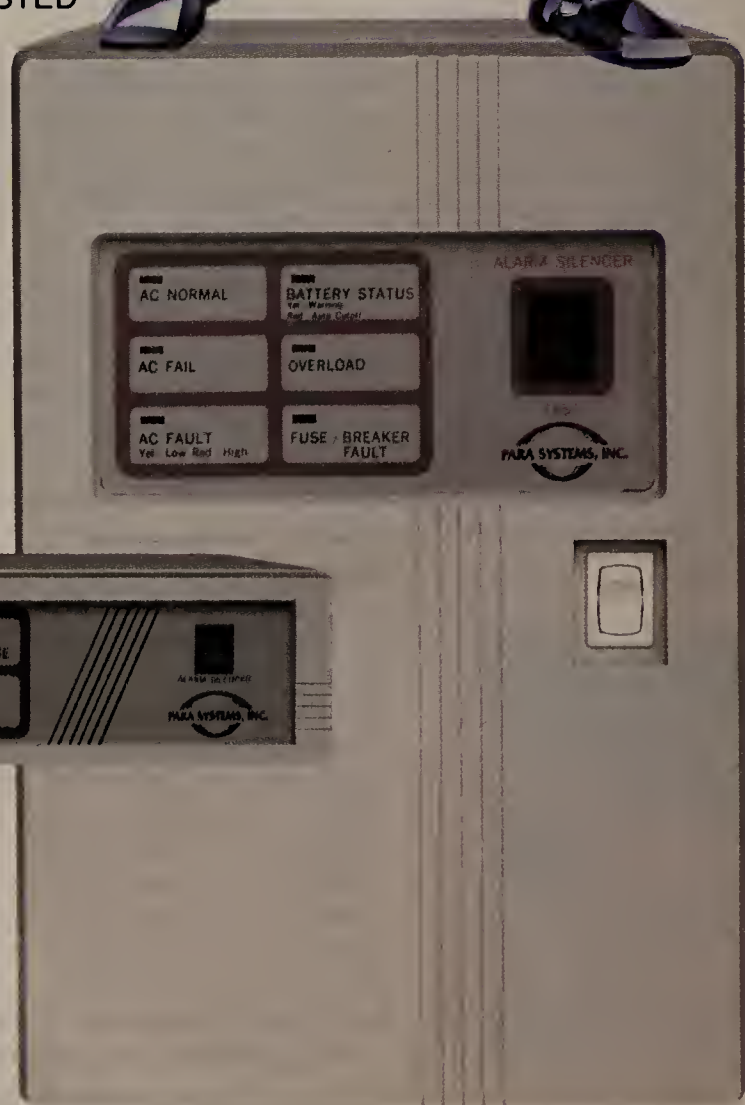

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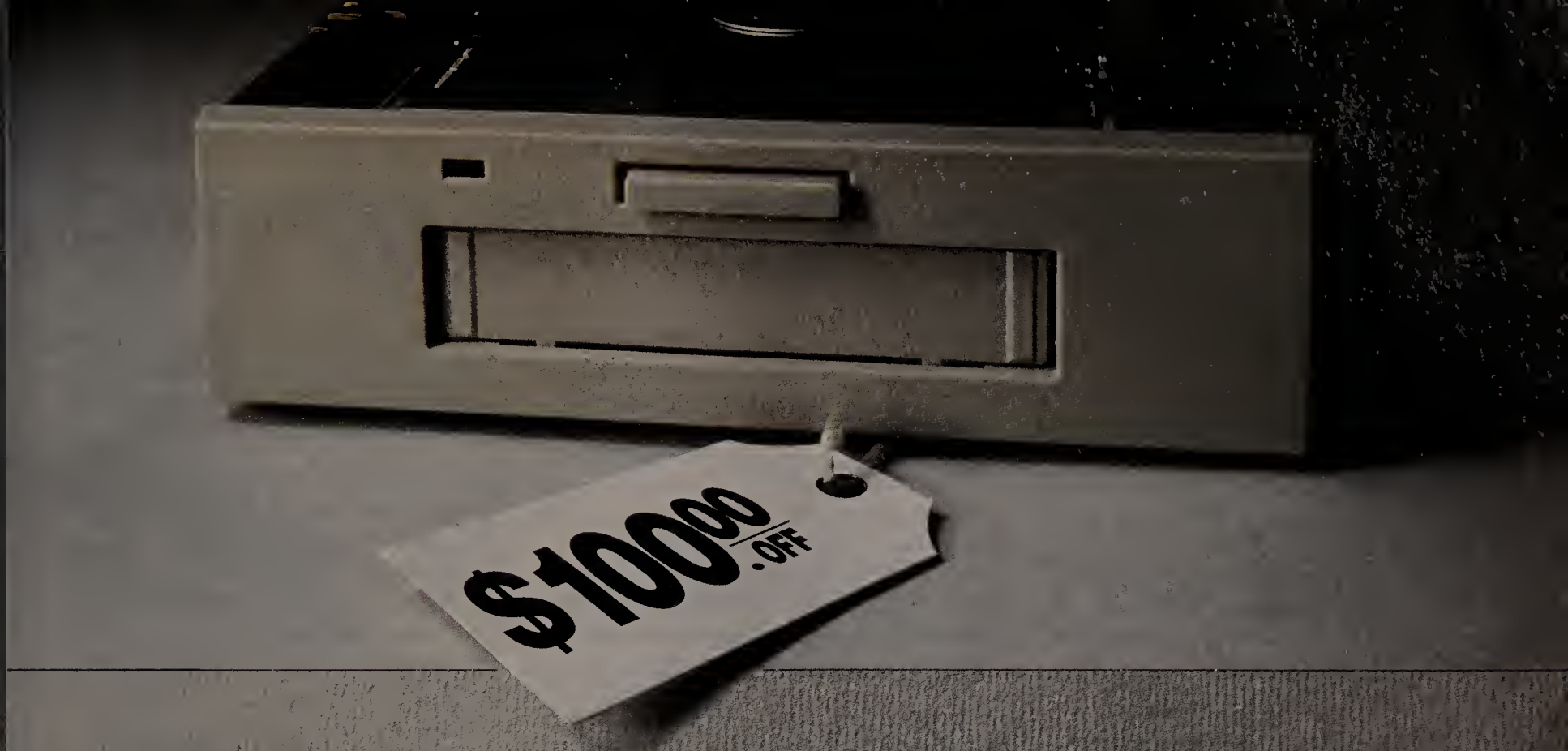

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Data Basics

Data Management

Tips and techniques for managing your data

This month: indexes demystified

Alan Schwartz

One problem with paper records is that they can be sorted only one way. If your invoices are filed by customer name, it's tedious work to find the first sale of September 30, or invoice number A-203. Keeping separate copies sorted by customer, invoice number, and date of sale requires a lot of extra work.

Computer data bases use *indexes* to effectively list the same records in different orders. An index works much like a library's card catalogs: It doesn't contain data, but it tells you where to find it. And just as the card catalogs list books by title, author, or subject, multiple indexes can list data in as many ways as you need. Furthermore, locating a record is much faster with an index—without one the program has to search through the entire table. Unlike card catalogs, indexes access data automatically and don't require user intervention to do their job.

In *dBASE III Plus* each index is a separate file. To create a *dBASE* index, open the data file, then issue the command **INDEX ON** *key* **TO** *filename*. The *key*—a field, group of fields, or a formula involving fields—is the criteria for sorting the records. For instance, the command **INDEX ON CustID TO custidno** will create an index sorted by the contents of the CustID field and save that index to a file called CUSTIDNO.NDX.

Index names should reflect the DBF table files they belong to and their sort order. To alphabetize customer records by name, you'd use a command like **INDEX ON LastName + FirstName to CUSTNAME.**

Note that this key has two fields, ensuring that Fritz Freleng precedes Thomas Freleng. Index keys can include complex expressions and functions as well. Indexing on **CTOD("12/31/80") - InvDate** will order the records by the InvDate date field in reverse order, from the most recent date to the oldest one. (The CTOD() function converts text strings to dates and—with versions prior to *dBASE IV*—is the only way to enter a date at the command line.)

Using and Maintaining Indexes

If a librarian places a new book on a shelf without inserting cards in the catalogs, it's as good as lost. Similarly, every index on a table must be updated when a record is added, purged, or changed. *dBASE* keeps indexes up-to-date transparently, *but only if the indexes are open.* Modify even one record without all of the file's indexes open, and

DATA BASE TOOLBOX

On dMAND

Ever been frustrated by the work involved in creating a simple report? Applied Micro-Systems' *On dMAND* offers a quick and easy way to get bare-bones reports from dBASE data. With virtually no learning curve, this utility lets you toss your first report to screen, printer, or disk in fewer than ten keystrokes.

You can create simple columnar reports, labels, and summaries by selecting fields with your mouse or cursor keys. You can easily apply record selection criteria and a sort order to any field. You can save and distribute layouts with *On dMAND*'s royalty-free run-time.

But don't expect too much. You can't relate files, read memo fields, use indexes, format data, build expressions from functions, or sort more than 12,000 records. *On dMAND* permits only a one-line column heading, no page footers, and scant printer controls. Still, its utter simplicity will endear *On dMAND* to anyone who's overwhelmed by state-of-the-art report generators. The utility requires DOS 2.0 or a later version, 640K, and a parallel printer. —*A. S.*

On dMAND $59.95; Applied Micro-Systems, Inc., P.O. Box 832, Roswell, GA 30077; 404/475-0832
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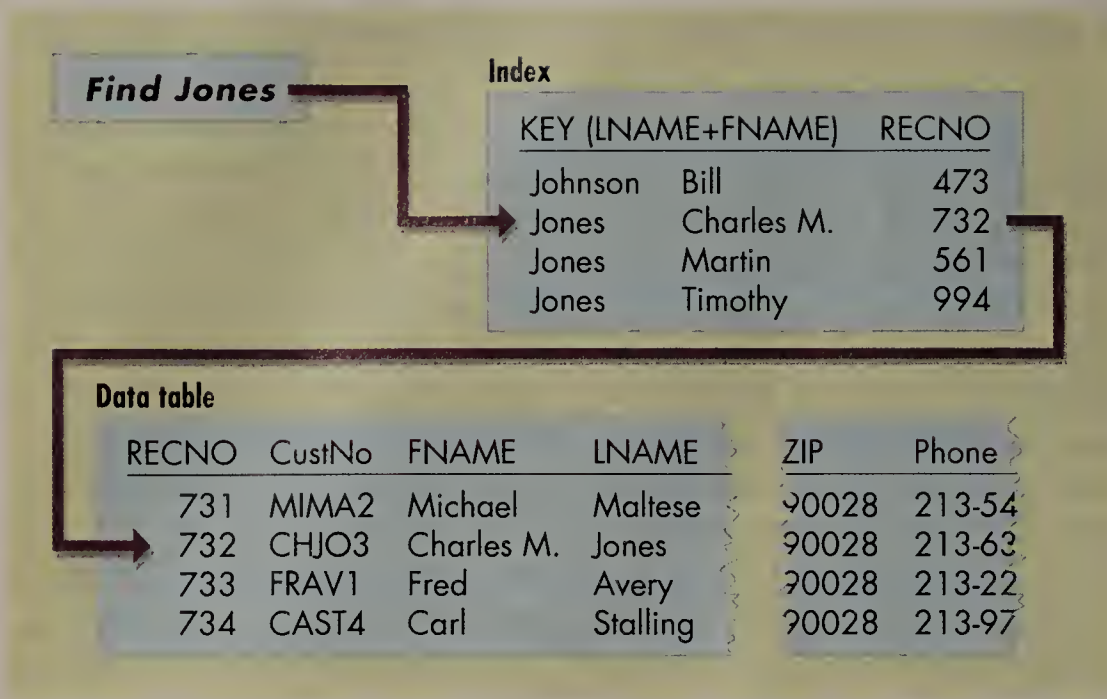
An Index at Work



A data base manager can search an index faster than it can search a data table, which is much larger and may not be in a convenient order. Once the correct key is found, the index points to the record in the data table.

you'll have to contend with apparently lost records, vexing error messages ('Record is out of range'), and incorrect reports. Many frustrated users have abandoned indexes altogether, incorrectly assuming that the indexing mechanism itself is buggy.

To avoid these problems, always open the indexes when you load a data file. This is done with the USE command, as in **USE customer INDEX custidno, custname.** The first index is the active one, controlling the record order; the others just tag along to keep abreast of changes. To make the second index active, use the command **SET ORDER TO 2.**

If you damage an index, don't worry. Your data is still intact—all you need do is recreate the index.

Searching With Indexes

To take advantage of indexing's speed improvements, use one of dBASE's index-specific search commands, FIND or SEEK. **FIND CHJO3** uses Charles Jones's Customer ID, for instance, to take you to his record, assuming that the CUSTIDNO index is active.

With SEEK, the search expression is the name of a field or a memory variable containing the item you're looking for. For instance, if you want to find the customer whose ID number is in a variable called mID, use the command **SEEK mID.** Keep in mind that with both FIND and SEEK, you must still EDIT or DISPLAY the record to see it.

By reducing long searches to instant retrieval and switching sort orders in a flash, indexes greatly improve access to your data. And that, after all, is what data management is about.

Correction

The August *Data Basics* included a listing for validating input, but the listing was incorrect. It should have read:

```
DO WHILE In_date < (DATE() - 365) .or.;
 In_date > DATE()
@ 8,3 SAY 'Invoice date: ' GET In_date
 READ
 IF In_date < (DATE() - 365) .or. In_date >;
  DATE()
  @ 9,3 SAY "Invoice date must be..."
 ENDIF
ENDDO
```

PC World regrets the error.

Alan Schwartz is a partner in Micromega Systems in San Francisco, specializing in custom data base application development. Celeste Robinson is the author of The Best Book of Paradox *(Howard W. Sams and Co., Carmel, Indiana, 1990).*

PARADOX SHORTCUT

CoEditing by Yourself

Celeste Robinson

Paradox has two table-editing modes: Edit and CoEdit. Although CoEdit is designed for network use, it also offers advantages to a single user:

1. In CoEdit mode, table indexes are updated as each new or changed record is posted to the table. (In Edit mode, indexes are updated only after you press <F2>.) An up-to-date index speeds searches when zooming on a keyed field.

2. In Edit mode, *Paradox* maintains a transaction log for updating the table and index files. Since CoEdit doesn't use a transaction log, it doesn't take as long when you update with <F2>.

3. Using CoEdit, you are warned of key violations immediately.

CoEdit has its drawbacks. Undo is limited to the last change made. Also, since indexes are updated automatically, records seem to disappear when you change their key fields. They are, of course, merely moving to their new position in the index.

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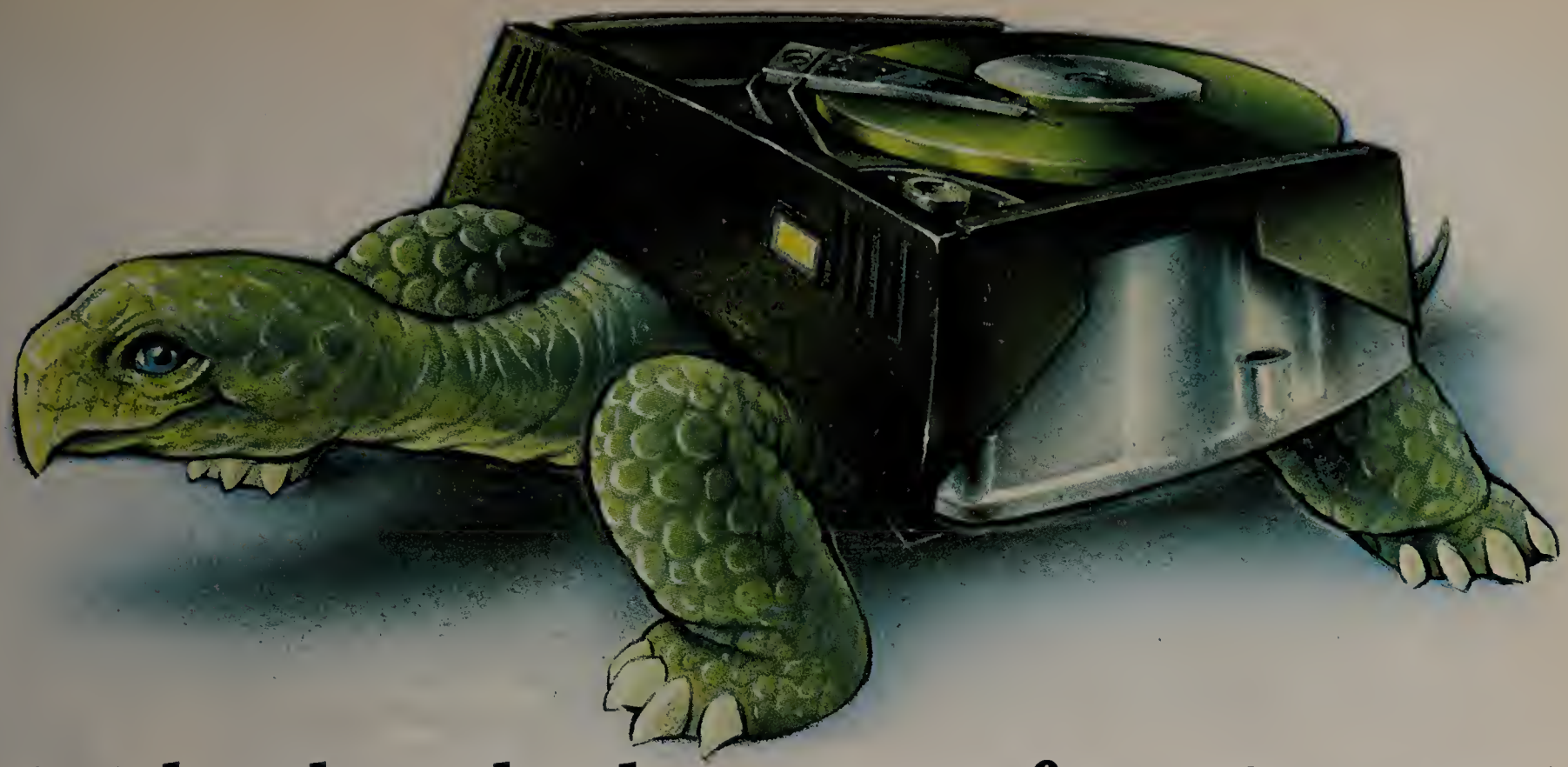

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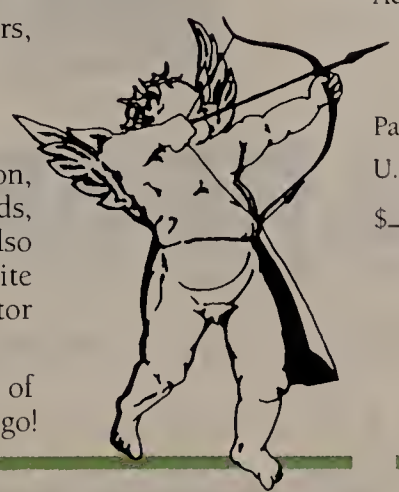

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The Art of Persuasion

Publishing & Graphics

Expert advice for creating high-impact documents and presentations

This month: tips on choosing and using the right type, and customizing Ventura headers and footers

Richard Jantz

The typefaces you use affect the way people perceive you and your business. Depending on the type used, a document may appear casual or formal, modern or old-fashioned, routine or refined —any of which may be appropriate.

Neophytes starting out with the basic LaserJet rarely stray from Times Roman and Helvetica. But with the boom in cheap PostScript emulators and cartridges for the LaserJet, font generators like *Fontware*, the Intellifont-based LaserJet Series III, and cheap PostScript printers, users have more fonts to choose from—and picking the right ones can be daunting.

So this month we look at selecting and using type. All the typefaces mentioned below are available from Adobe, Bitstream, and other major vendors. Although effective typography is ultimately a question of personal taste, consider the following guidelines.

- Choose type that matches your document's message. Typefaces with *serifs* (cross strokes at the ends of characters) often look traditional or elegant, while *sans serif* faces (without serifs) look modern and streamlined.
- As a rule, use serif type for *body text*—large blocks of copy typically 12 points in size or smaller. Serif charac-

NUTS & BOLTS

Customizing Headers and Footers in Ventura

Creating headers and footers in *Ventura* is easy if you use only one font, but combining fonts for a customized variation is trickier. You can assign only one font to a header or footer tag, and *Ventura*'s Set Font option (which appears in the assignment list in Text Editing mode) doesn't affect headers or footers. So how can you mix fonts? The answer is to insert *Ventura* formatting codes in the header or footer text when you create it.

For example, here's how to customize a centered footer, "LaserNews," with "Laser" set in Helvetica (or Swiss, if you're using a LaserJet) bold, and "News" in Times Roman (or Dutch) bold italic.

1. Start *Ventura* and open a chapter.
2. Select *Chapter*, then *Headers & Footers*. Click the *Right Page Footer* and *On* options.
3. Move the cursor to the first line of the 'Center:' label and type **Laser<F14BI>News**. F14 is the font code for Times (Dutch); BI is the bold italic code.
4. Move the cursor to the second line of the 'Center:' label and click *Text Attr.* and *Page #*. This inserts '<D>[P#]' in the footer's second line. The '<D>' is *Ventura*'s default code and resets the text back to the default fonts, which you'll make Helvetica (Swiss) bold in step 6. The '[P#]' tells *Ventura* to paginate the entire chapter.
5. Click *Copy To Facing Page* to place the same footer on all left pages as well, and then click *OK*. The new footer will appear at the bottom of the page.
6. To specify the font for "Laser" in "LaserNews," click *Ventura*'s Paragraph Tagging icon, then click the footer. Select *Paragraph Font*, then *Helvetica Bold* (*Swiss Bold*), pick the desired point size, and click *OK*.

You can use this same technique to insert other *Ventura* codes in headers/footers to mix font sizes, shift or kern text, add nonkeyboard characters (dingbats, fixed spaces, foreign-language marks), and so forth. For a complete list of the codes, consult the appendices in *Ventura*'s Reference Guide. —*R. J.*

ters are more legible, especially at small sizes. Good picks: Times Roman or New Century Schoolbook to project a conservative attitude; ITC Bookman or ITC Souvenir for a warmer tone; and Palatino, ITC New Baskerville, or ITC Garamond to add elegance and authority.

- Sans serif type is best for *display text*—short units of copy, such as titles, headlines, subheads, and pull quotes. Helvetica, News Gothic, Univers, or Gill Sans presents a neutral voice; ITC Avant Garde or Futura is good for a machinelike look; and ITC Franklin Gothic Heavy or Helvetica Black commands attention.
- Avoid monospaced "typewriter" fonts, such as Courier. To enhance your business correspondence without making it look too formal, try ITC American Typewriter, Bitstream Charter, or Stone Informal.
- To simplify mixing and matching type, build your type library with variations in the same typeface *family*. This approach works well for documents like catalogs, data sheets, and heavily enumerated reports. A typeface family includes several character widths (such as condensed, expanded, ultra expanded) and weights (light, medium, heavy) for a given typeface.
- Using a single typeface family can add a dignified look to a report or proposal. Pick Palatino or ITC Galliard, for instance, and use bold and bold italic for display text, normal ("roman") for body text, and italic for emphasis.
- To add a dynamic look to a newsletter or brochure, use contrasting typefaces from different families. For example, use a sans serif typeface like ITC Avant Garde for heads, with serif body text faces such as ITC Bookman or Palatino (see **TABLE 1**).
- Don't use more than two or three different typeface families on a page. For example, use one typeface for display text, one for body text, and the third for an occasional item, like a logo.

Finally, study how the pros combine and use typefaces. Two good reference books are *Type From the Desktop* (Ventana Press, Chapel Hill, North Carolina, 1990) and *Using Type Right* (North Light Books, Cincinnati, 1988).

PC World contributing editor Richard Jantz is the author of Ventura for Windows 3.0 *(John Wiley & Sons, New York, 1990).*

DESKTOP PUBLISHING TOOLBOX

FontSpace

If you use downloadable fonts with your LaserJet, you know how much disk space they can take up. But with Isogon's $90 *FontSpace*, you can shrink font files by 50 to 97 percent. In one case, *FontSpace* packed 9.6MB of fonts into 430K. Better still, once *FontSpace* compresses fonts, it runs in the background and automatically expands fonts on the fly as needed. *FontSpace* is compatible with *PrintCache*, *BackLoader*, other print utilities, and various networks. *FontSpace* is an excellent, cost-effective alternative to buying a larger hard disk. —*R. J.*

FontSpace $89.95; Isogon Corp., 330 Seventh Ave., New York, NY 10001; 800/662-6036 (orders only), 212/967-2424, 212/967-3198 (fax)
Reader service no. 610

TABLE 1

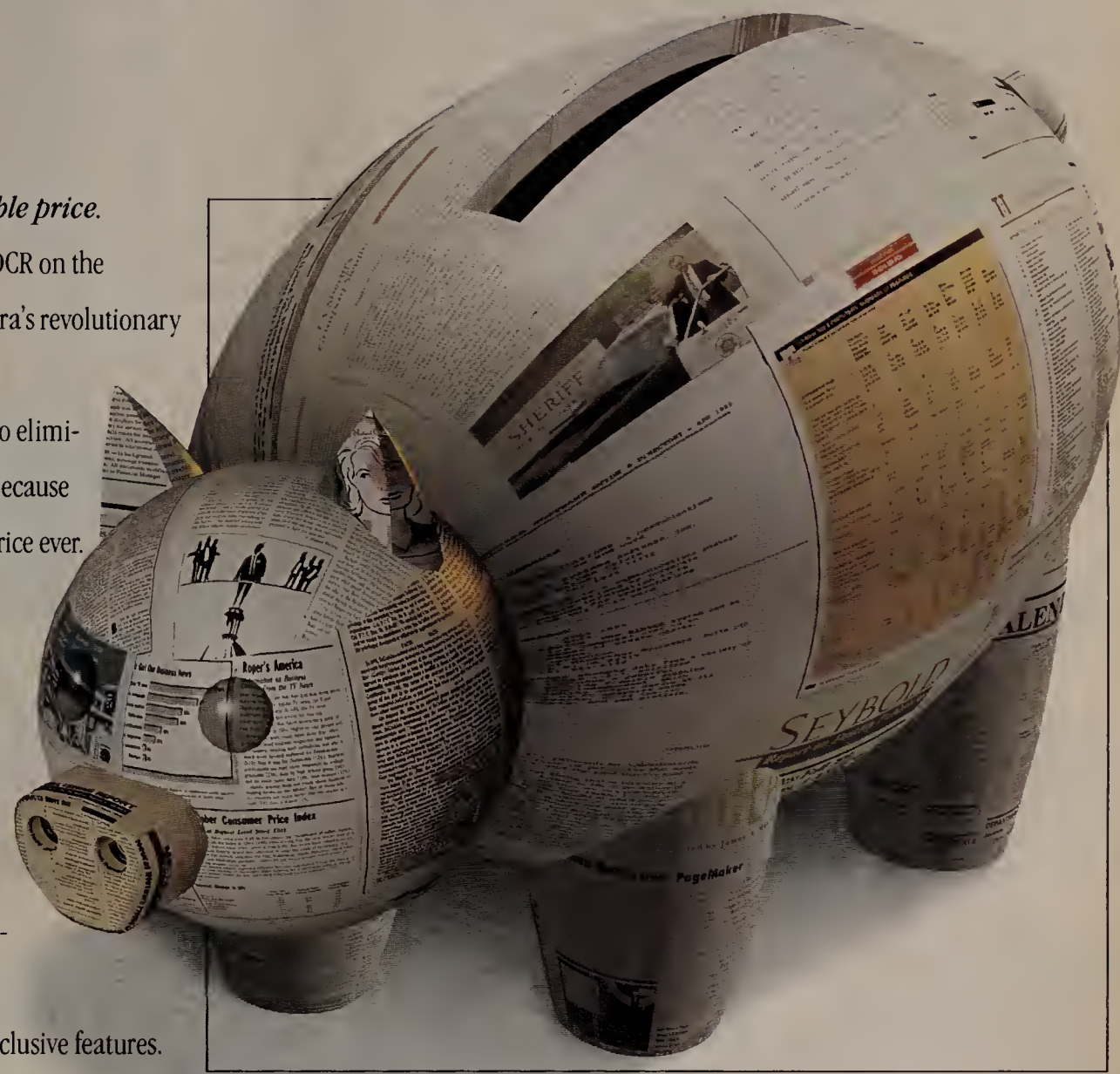
Mixing Type Effectively

Wondering which typefaces work together best? Start with these suggestions when designing newsletters, reports, brochures, and fliers.

Headline Typefaces	Text Typefaces	Applications
Bitstream Charter Bold	Bitstream Charter	Business correspondence, reports
Futura Bold	ITC New Baskerville	Newsletters, brochures, magazines
Helvetica Black	ITC Garamond	Newsletters, brochures, books, magazines, fliers
Helvetica Bold	Times Roman	Any document; a safe but common choice
ITC Avant Garde Gothic	ITC Lubalin Graph	Business reports, presentations
ITC Franklin Gothic Heavy	Century Old Style	Newsletters, brochures, fliers
ITC Franklin Gothic Heavy	ITC Galliard	Newsletters, brochures, fliers
ITC Lubalin Graph Bold	Helvetica Condensed	Presentations, brochures, fliers
Palatino Bold	Helvetica	Business reports, newsletters
Palatino Bold Italic	Palatino	Business reports, books
Stone Informal Bold	Stone Informal	Business correspondence, reports
Stone Sans Bold	Stone Serif	Newsletters, manuals, business reports
Univers Bold 65	Lucida Roman	Forms, schedules

Introducing Twice The OCR At Half The Price.

SEE US AT SEYBOLD BOOTH #2302



Unbeatable OCR at an unbeatable price.

If you didn't think you could afford the best OCR on the market, think again. Think WordScan,™ Calera's revolutionary new OCR software.

Now it really makes sense to use OCR to eliminate most of the retyping you do every day. Because WordScan's features are the best. At the best price ever.

The end of ordinary OCR.

What makes WordScan extraordinary are its standard features. Like its ability to read virtually any printed document directly into your word processor, desktop publisher, database or spreadsheet more accurately than any other OCR product. Even bad photocopies and faxes!

And WordScan Plus adds even more exclusive features.

Our unique *pop-up editor* makes proofing a snap. It pops up an enlarged image of any questionable word for instant verification, so you don't have to refer to the original hard copy.

Deferred processing lets you scan documents now, and perform OCR later when you don't need the computer.

You can even *"clip"* selected portions of pages like magazine articles, then stack them for deferred processing. An important time-saver!

Process multiple documents into separate files automatically. Just put a blank page between documents and WordScan does the rest.

And you can reformat material any way you want with our *style sheet feature.* Another WordScan Plus exclusive!

And the list goes on. *Nobody else can match these features.*

WordScan and WordScan Plus are completely compatible with Windows 3.0 and they do everything with just 2 MB of memory. At about half the price you'd expect to pay for OCR that doesn't do half as much.

WordScan is available now at $595; WordScan Plus, $995. Call 800-544-7051 for the name of the Calera dealer nearest you. And don't forget to ask for your free copy of our OCR evaluation booklet.

WE'LL PAY GOOD MONEY FOR BAD OCR.

FOR A LIMITED TIME, TRADE IN YOUR OLD OCR AND GET HALF OFF THE PRICE OF WORDSCAN OR WORDSCAN PLUS! 30-DAY, MONEY-BACK GUARANTEE. CALL 800-544-7051 FOR DETAILS.

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RECOGNITION SYSTEMS

2500 Augustine Drive, Santa Clara, CA 95054 USA. 800-544-7051; outside USA, 408-986-8006; FAX 408-986-1440

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Circle 42 on reader service card

256 Color Graphics Doesn't Have To Cost A Lot.

Make childs play out of high resolution color graphics with Trident's new TVGA 8916 series VGA boards. With 256 colors in all high resolution modes, faster graphics processing speed, and a flicker-free monitor refresh rate, an 8916 board can help make anybody look good.

More Colorful Hi Res Drivers

Of the 45 boards listed in PC World's (May 1990) Buyers Guide on Super-VGA Boards, only Trident's 8916-8 gives you 256 colors in 1024 x 768 resolution for Windows 3.0, Presentation Manager, AutoCAD, Ventura, and GEM. We also support most of your other favorite applications, some great new rookies, and 8514/A emulation.

MICROSOFT WINDOWS Version 3.0 Compatible Product

Fastest in its Class

And when it comes to speed, we don't kid around.

According to PC Magazine (the 8916)... *"was about 20% faster than all other direct-access boards in both Microsoft Windows and AutoCAD tests."* Our unique sequencer directs traffic between video memory and the system processor for faster screen updates without costly video RAM. The 8916's built-in cache memory, 32-bit memory bus, non-interlaced or interlaced modes, and 72Hz refresh rate deliver a flicker-free display while maintaining the high speed CPU expressway.

To find out more reasons why the 8916 should be your choice in a VGA graphics board, visit your local dealer for a complete test drive.

The Trident 8916 Series. The new leader in high end PC/XT/AT and PS-2 Model 30 color graphics at a remarkably low end price.

TRIDENT Microsystems, Incorporated

Trident Microsystems, Inc.
321 Soquel Way, Sunnyvale, CA 94086.
Tel: 408.738.3194; Fax 408.738.0905

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Circle 283 on reader service card

The Ultimate...

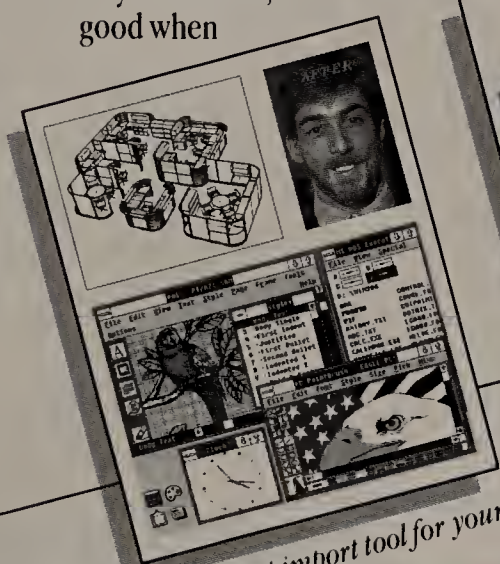
Screen Capture and Print Software

You know how much time you spend in the creation of perfect graphic images. Ones that display your views, ideas, and creativity. Well, don't stop at the screen. *Pizazz Plus* will take your screen based images and print them anywhere and anyway you want, as well as create files directly compatible with any popular desktop publisher. With *Pizazz Plus,* you can capture the entire screen or isolate a section. Adjust size, proportion, rotation, or placement on the page. You will see more detail and texture in your B&W prints and desktop publishing files with up to 256 shades of gray. For color printers, your prints will come to life with a rainbow of print shades and options.

What you see is just the beginning. Since the introduction of *Pizazz* (PC World "Software Hits of 87"), it has been without question the best tool available for the reproduction of screen based graphics and/or text. The bottom line is, if it looks good on your screen, it will look good when printed or merged into your report, brochure, or presentation. *Pizazz Plus* doesn't just print images, it pushes your printer to its maximum capability to produce a masterpiece. And, it's memory resident—your image is never more than a keystroke away from professional printing or importing into your desktop publisher.

PC MAGAZINE
EDITORS' CHOICE
April 24, 1990
Pizazz Plus

All images were produced with Pizazz Plus.



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Memory resident program takes as little as 32K. All manufacturer's names or product names are registered trademarks of their respective manufacturer. Screen images courtesy of AT&T and Facet, Inc.

Application Techniques, Inc.
10 Lomar Park Drive, Pepperell, MA 01463
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Circle 6 on reader service card

If you're thinking about utilities, consider the utilities that do the thinking for you.

The Norton Utilities® 5.0 is more than just a powerful new version of a classic, award-winning bestseller.

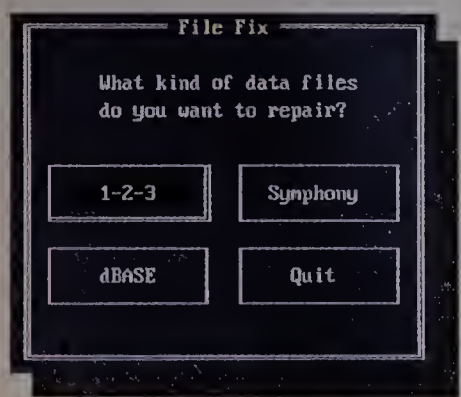
It's the best thing to happen to PC utilities since we invented them in the first place.

That's because the people who brought you the legendary *UnErase*® and the revolutionary *Norton Disk Doctor*® have cooked up another remarkable innovation.

Intelligence.

It's built in to each and every one of the 20 utilities in this package.

Which means that each and every person who uses a PC—yes, even outright novices—can use the Norton Utilities to perform a variety of sophisticated support tasks.



The new Norton Utilities corrects problems other programs can't even detect. File Fix, *for example, fully reconstructs damaged 1-2-3, Symphony® and dBase files.*

Without the aid of a sophisticated support person.

Whether you want to maximize your PC's performance, minimize the chances of data loss and disk failure, or just get yourself out of a jam, you need to get yourself the new Norton Utilities.

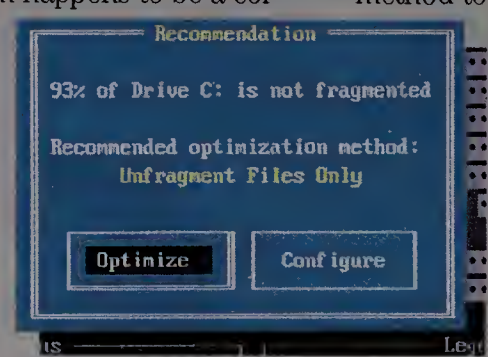
Having the Utilities on your disk—or on your network—is like having Peter Norton at your elbow.

In fact, our enhanced user interface includes a unique new feature that works with you just the way Peter would.

Advise not only helps you identify your particular problem, it also recommends the appropriate course of action and executes the appropriate utility.

Automatically.

If the problem happens to be a corrupted hard disk, you'll see right away why the *Norton Disk Doctor II* is the most sophisticated utility of its kind in the world.



Now everyone from novices to experts can safely perform in-depth preventative maintenance and file recovery with a few simple mouse clicks.

Disk Doctor II finds and fixes problems other programs can't even detect. Yet it's simple enough for beginners to use.

The same goes for *File Fix*,™ an invaluable new tool that delves into the complex internal structure of your Lotus® 1-2-3,® dBase® and compatible spreadsheets and databases to make repairs that would stymie even a skilled technician.

UnErase performs data searches automatically and shows you a list of all the deleted files on your disk. So all you have to do is point and shoot.

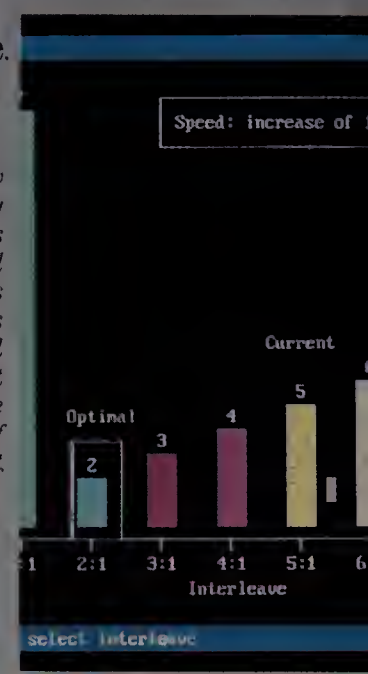
It also does something no other program can do: recover deleted files from anywhere on your network.

If all of that sounds like reason enough to join the army of happy Norton Utilities users, it is.

And we haven't even told you about the feature those users have most often requested.

Calibrate™ analyzes and adjusts the "interleave" of your hard disk, optimizing the read/write speed and dramatically improving performance.

Of course, when it comes to improving performance, there's nothing quite like *Speed Disk*.™



Our new Calibrate *utility revitalizes demagnetized disk areas and uses a low-level formatter to adjust your disk when the heads go out of alignment.*

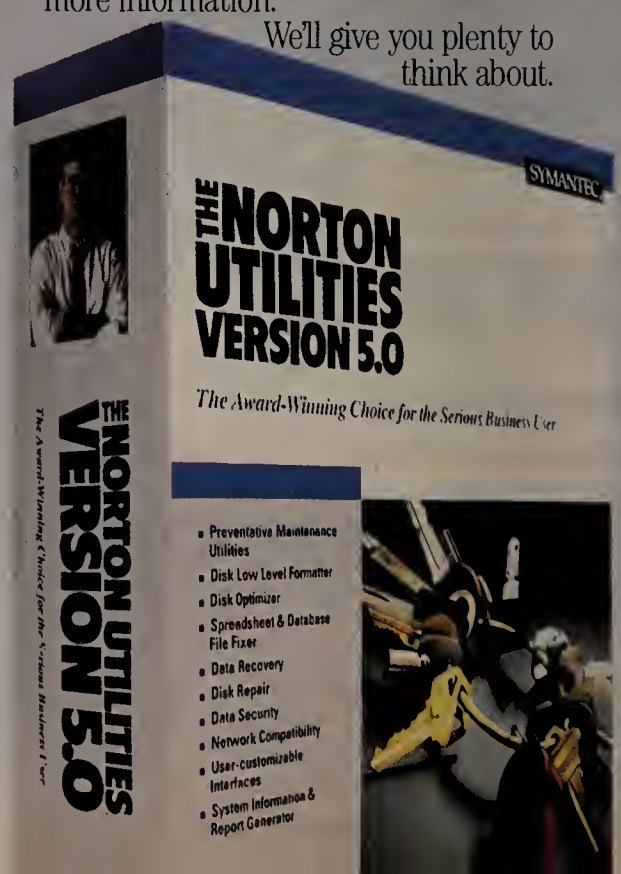
It not only offers four different optimization methods, it figures out exactly how fragmented your disk has become and tells you which method to use.

Nobody has to tell you how serious it is when the power goes out. So you'll be glad to know that *Calibrate, Speed Disk* and *Disk Doctor II* are designed with a unique failsafe architecture.

If you lose power during a procedure, you won't lose your data.

So don't lose another minute. Call 1-800-343-4714 Ext. 702W and demand more information.

We'll give you plenty to think about.



The new Norton Utilities 5.0 from Symantec

BUY VERSION 5.0 NOW AND GET A NORTON BACKUP FREE! (See package for details.)

Circle 203 on reader service card

The Information Edge

Communications

On-line resources for business and professional users

This month: Scope out special-interest newsletters with NewsNet, and simplify stock analysis with MetaStock.

Judy Heim

Special-interest newsletters are often the first places important news about a given industry turns up—but there are thousands of them, and keeping an eye on more than a few can be costly. For nearly a decade, NewsNet has offered on-line access to the world's largest collection of newsletters, with special emphasis on high-tech industries ranging from biotechnology to semiconductors.

NewsNet users can search the full text of the data base for keywords. In addition, a feature called NewsFlash offers instant access to breaking news by monitoring incoming wires and newsletters 24 hours a day and culling stories on topics of users' choosing.

NewsNet is not cheap, but its users (who are typically corporate librarians, industry analysts, and executives for well-heeled companies) need timely information and can afford to pay top dollar for it. Furthermore, while some of NewsNet's newsletters can be found in other on-line libraries like Dialog's PTS, NewsNet boasts over 400 newsletters while PTS offers only 100-plus. And at least 30 percent of NewsNet's data is available nowhere else on line.

NewsNet also includes 11 major international wire services, including Reuters, AP DataStream Business News, Japan's Kyodo Press Ticker Service, the U.S. Department of Commerce's Commerce Business Daily, and Com-Line Japan Daily, a brand-new service that covers developments in Japan's high-tech industries.

Using NewsNet is as simple as skipping stones. After you type **search**, NewsNet prompts you to enter codes for news sources to search, publication dates, and keywords to look for. (These codes are listed in a NewsNet handbook.) NewsNet then searches the full text of the data base. If it finds any matches ("hits"), it sends you a list of headlines. At this juncture, you can choose to skim a summary of an article, or you can elect to read the entire story.

Monitoring current newsletters via NewsFlash works the same way. Once you set search criteria, every time you log on, NewsNet tells you if you have any hits waiting.

NewsNet's fatal flaw is its eye-popping price. The annual subscription fee is $120, and connection costs run as high as $750 an hour (depending on the bps rate and the surcharge for the news source read). There's also a 50-cent charge for each hit delivered from NewsFlash. In comparison, Dialog's PTS charges a flat $136 an hour, plus a yearly $35 subscription fee.

NewsNet accesses breaking news instantly and culls stories by topic.

Obviously, if you *must* have on-line access to a newsletter that's available only on NewsNet, the expense will be justified. Moreover, NewsNet's huge collection of marketing and high-tech newsletters and wire services is undeniably seductive, as is its ease of use

THE ON-LINE TOOLBOX

Y-Plug

Are your on-line sessions disrupted when someone picks up the extension phone in the next room? The Message Stopper from Jasco Products will save your bacon. Simply snap this souped-up Y-plug into the phone jack in the next room. Then, as long as your modem or phone is conducting a call, the Message Stopper disables the extension. When your modem hangs up, the extension phone is reenabled. This essential gadget retails for around $14 at Target, Montgomery Ward, and Shopko stores, among others. —*J. H.*

THE PROFESSIONAL EDGE

Analyzing Stock Prices the Easy Way

Joel Tepp

It wasn't long ago when the only easy source of stock quotes was the evening paper, and even simple analysis required hours with a pencil and pad. Now quotes can be downloaded from dial-up data bases like Dow Jones News/Retrieval and analyzed with a number of software packages. Some packages popular with brokers, like *Computrac,* cost thousands of dollars; others are less expensive but lack the power for complex analysis.

Equis International's *MetaStock Professional 2.0* bridges the gap between power and affordability. For only $349 it offers just about all the basic mathematical tools an investor needs for technical stock analysis (manipulating market variables of price, volume, and time). The newest version includes stunning charts and graphics, breakneck computation thanks to math coprocessor support, and the ability (new in this version) to save charts and settings so you can easily recall them for your next session.

First you download market quotes from one of the dial-up services like Dow or Warner Computer Systems, using your own communications software, and save the data. *MetaStock* uses the industry-standard *Computrac* file format, but it can import and convert a number of others, including *1-2-3*'s WKS and WK1, ASCII, and DIF.

MetaStock's opening screen then lists all the stocks in your data base and their date ranges. With a few keystrokes, you can turn that data into revealing graphs and charts that make it easy to perform a technical analysis of the relationships between stock prices and various indicators or oscillators in the financial marketplace.

You can use up to 36 windows for charted data; unfortunately, you can't exchange data between them. You can also access technical tools, like formulas for relative strength and standard deviation, via easy-to-use dropdown menus.

The program includes 63 mathematical formulas for calculating custom buy-and-sell signals, and you (or your financial advisor) can custom design up to 60 more. Once you have matched an indicator (or combination of indicators) to a series of prices, be they stocks or futures, *MetaStock* lets you create and test hypothetical rules for buying and selling. A report will show the resulting profit or loss.

MetaStock's profit analysis capabilities are less powerful than those in pricier programs like *System Writer,* and it lacks some of the esoteric charting routines found in *Computrac.* But its low price and easy interface put the essentials of complex stock analysis at the service of investment novice and pro alike.

MetaStock Professional 2.0, Equis Int'l, P.O. Box 26743, Salt Lake City, UT 84126; 800/882-3040, 801/974-5115, 801/974-5130 (fax)
Reader service no. 663

(especially compared to Dialog's notoriously nasty interface). Nonetheless, given its high price, we recommend making sure the news sources you need aren't available elsewhere, for less, before signing up.

Judy Heim is a contributing editor for PC World, *and Joel Tepp is a broker with Bateman Eichler, Hill Richards in Seattle, Washington.*

WHERE TO BUY

NewsNet
Independent Publications
945 Haverford Rd.
Bryn Mawr, PA 19010
800/345-1301, 215/527-8030
Reader service no. 662

POWER TIP NO. 139

Protecting System Files From Accidental Deletion

You're working in an application directory on your hard disk with a job running longer than expected. So you decide to make room on a recycled floppy to copy files and finish the project at home. You type **dir a:** and see that you no longer need the data on the floppy disk, but then you type **del** *.*, and when DOS asks 'Are you sure (Y/N)?', you answer 'Y', erasing all the files in your application directory!

Protect yourself from this type of accident by using the DOS command **attrib +r** *.* to make all files in your applications directory read-only. You can unprotect individual files that require regular updating (personal dictionaries and so on) by typing **attrib -r** *filename.*

Rex Farrance
Assistant Editor

HIGHLY RECOMMENDED

When Accounting Today (May 1990) asked accountants which accounting software package they recommended to their small business clients, an overwhelming 29% said they recommend Peachtree's General Ledger–that's almost double the next largest competitor.

Reseller Management (March 14, 1990) asked resellers which accounting package they recommend and Peachtree came out on top again with 25% of resellers recommending it.

But accountants and resellers aren't the only ones giving Peachtree rave reviews:

"If you could find a definition for Peachtree in the dictionary, it might be 'value for your money.'"–PC Magazine 4/10/90

"It is, I believe, the best accounting package available for the price."–E.J. Bosmeny, CPA, Naperville, IL

"Complete III rivals packages costing 10 times as much."–PC Resource, July 1990

If there's one thing people agree on, it's what a great value Peachtree's Double Bonus Bundle is. That's because it includes two first-rate software packages for one low price–Peachtree Complete III, a full-featured accounting system, and Peachtree Data Query III, a reporting and analysis tool.

Peachtree Complete III includes nine high-powered modules to meet all your business accounting needs.

- General Ledger
- Accounts Payable
- Accounts Receivable
- Payroll
- Inventory
- Invoicing
- Purchase Order
- Fixed Assets
- Job Cost

Peachtree Data Query III gives you custom access to the vital accounting data in your Peachtree Complete III files. Choose from PDQ's predefined reports, customize your own reports (and store the formats for future use), even export data to popular applications like Lotus 1-2-3® and dBASE®, with no risk to your files, and no re-keying of data.

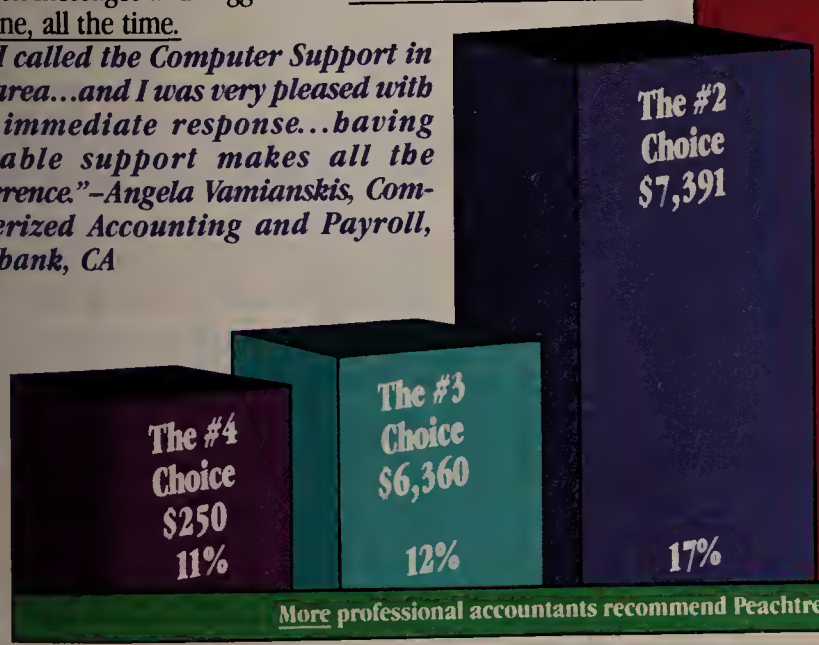
And, Peachtree is the one accounting system you won't outgrow. Install the functions your company needs now and add modules, departments or even companies to the system as your business grows.

"...It is, beyond a shadow of a doubt, the best, easiest to use, most helpful program I've ever had to review."–C. McQuaid, McQuaid & Holland, Inc., Accountants, Geneva, AL

"Installation is easy, data entry is fast...a joy to use."–PC Resource, July 1990

With Peachtree, you don't have to give up ease of use to get the power and performance you need. The Double Bonus Bundle comes with on-line tutorials for each module and thorough documentation–an Accounting Primer, a quick-start installation Guide, and a complete reference library–so you can get up and running quickly. Errors are handled with plain English messages and suggestions. Context-sensitive HELP is on-line, all the time.

"I called the Computer Support in my area...and I was very pleased with the immediate response...having reliable support makes all the difference."–Angela Vamianskis, Computerized Accounting and Payroll, Burbank, CA



At Peachtree, we make technical support convenient for you with Authorized Support Centers in over 60 cities across the country and directly from Peachtree (support charges based on the length of the call on your credit card). And we stand behind our products with a 30-day money-back guarantee when you buy directly from Peachtree. If for any reason you're not satisfied, just return the package within 30 days for a prompt refund (less a $25 restocking fee).

"...It's the only application I recommend. The package is superb..."–Marc Barlow, Executive Vice President, AdMedia, Largo, FL

Order Peachtree's Double Bonus Bundle NOW! Find out what over 350,000 satisfied Peachtree users already know–why so many people highly recommend Peachtree.

Features

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- Prints checks
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- Maintains open item or balance forward customers
- Unlimited transactional detail
- "Ship to" address file

Purchase Orders
- Updates purchase orders and inventory
- Generate A/P invoices from purchase order

Job Cost
- Tracks profitability on a job-by-job basis

Payroll
- Unlimited number of employees
- Accrues sick and vacation time
- Prints checks, W-2's calculates Federal and State payroll taxes

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- Unlimited inventory items
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- Handles 13,000 assets and 13 methods of depreciation

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- Modify pre-defined reports
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- Present data in line or bar graphs
- Transfer information to dBASE III® and Lotus 1-2-3®

Hardware Specifications. Requires PC/MS-DOS version 3.0 or higher with 640K of memory and a hard disk. For use with IBM PC, PC XT, PC AT, Personal System/2 and compatibles 3½" media optionally available. Not copy protected.

Lotus 1-2-3 is a registered trademark of Lotus Development Corporation. dBASE is a registered trademark of Ashton-Tate Corporation. IBM is a registered trademark and Personal System/2 is a trademark of International Business Machines.

Peachtree Software

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PCW

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You could be one of the Grand Prize winners who'll enjoy an all-expenses-paid trip for two to the restaurant of your choice, anywhere in the U.S. It includes all transportation, meals and hotel for 6 nights. Or one of the thousands of 2nd Prize winners who'll dine in style with an American Express "Be My Guest" Restaurant Certificate worth $100.00. There's even a second-chance drawing for a 3-day, 2-night mini-vacation. Look for game tickets in specially marked packages.

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Try it. Depend on it. BASF

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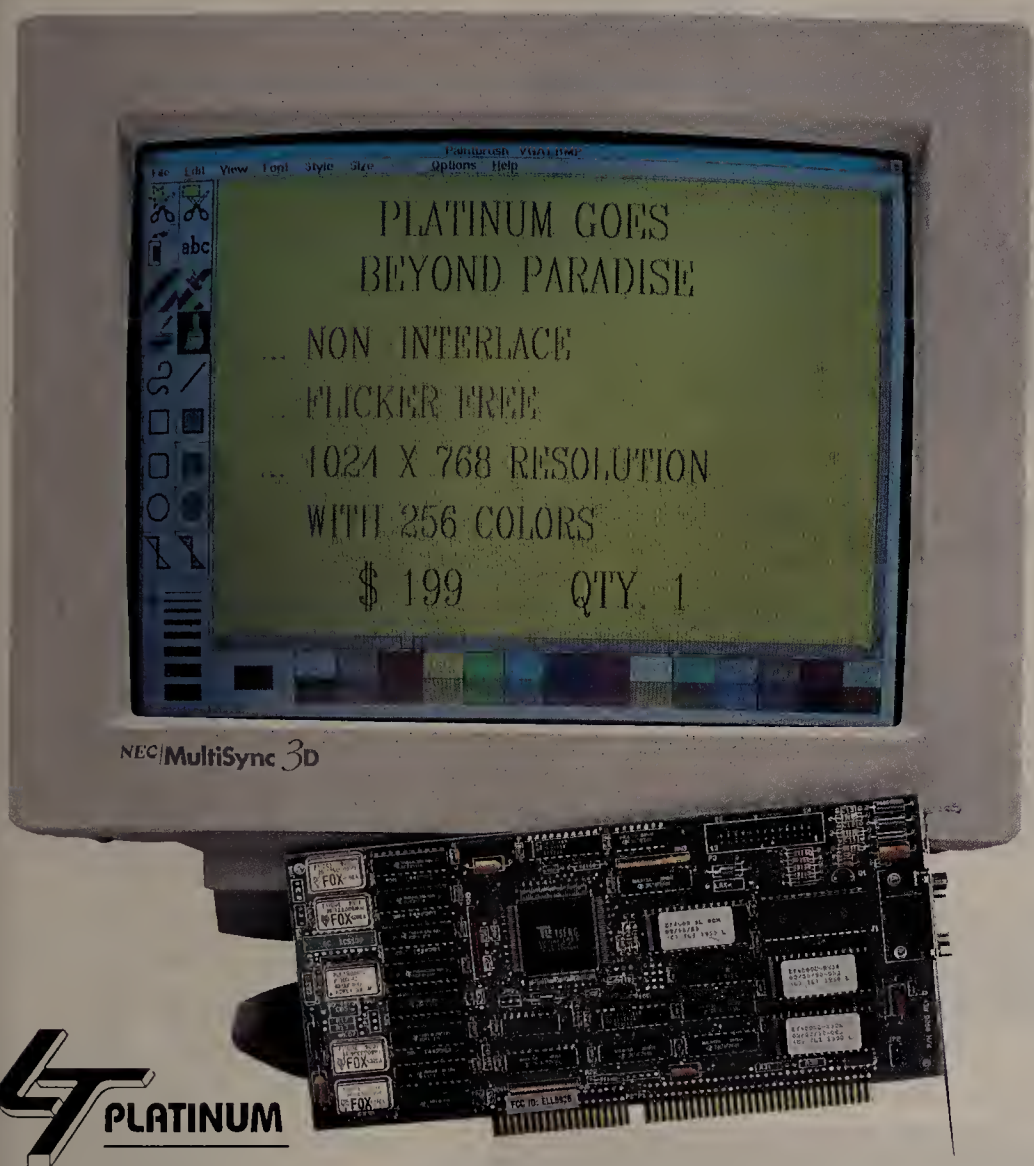
Circle 32 on reader service card

BYE, BYE PARADISE ... HERE COMES PLATINUMS SuperCache™ VGA BOARD!

VARS WANTED



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User Group Tips

Helpful hints from members of the nation's user groups

MORE Automation

The DOS command TYPE *filename* does a fine job of presenting on-screen listings of short ASCII files, but long files scroll by too quickly to be read. Using the command **type** *filename* | **more** allows you to read the information a screenful at a time. Create the following batch file to cut down your keystrokes:

```
@echo off
type %1 | more
```

Just make sure that MORE.COM is in your DOS directory and that the DOS directory is in the PATH statement in your AUTOEXEC.BAT file. Name the file TM.BAT or another easy-to-remember batch-file name. Then when you type **tm** *filename* and press <**Enter**>, DOS will present you with a screenful of text. Press <**Enter**> when you are ready to read the next screen.

George W. Crumley, Jr.
PCShare.RCA Users Group
Merrick, New York

Microsoft Word Columns for Easy Indents

Microsoft Word allows you to set up snaking and side-by-side columns. The Column Selection feature can also save you effort when you're working with lists. Suppose you have a list of names that you want to indent to the first tab. You could move the cursor to the beginning of each line and press <**Tab**>, but there's an easier way to set a lot of tabs at once. Select <**Esc**>*Options Visible: Complete* (<**Esc**>*Options Show nonprinting symbols All* for version 5.0) so that you can see the space, tab, and paragraph marks. Then move the cursor to the first letter of the name that begins the list. Press <**Shift**>-<**F6**> to turn on Column Selection. Using the mouse or the <Cursor Down> key, select the text down to the first letter of the last item in the list. Then press <**Tab**> once, and *Word* will insert a tab at the beginning of each line. Use the same technique to delete a column of tabs: Just turn on Column Selection, select the column of tabs, and press <**Delete**>.

You can also use Column Selection to add a new column, such as a list of department numbers, to the right of the name list. Select the entire column of names, and use <**Esc**>*Format Tab Set* to set tabs to place each column. Make sure you allow sufficient room to accommodate the longest items. Put your cursor on the paragraph mark at the end of the top line of the list. Add spaces until your cursor has moved to the right of the longest item in the list. Press <**Shift**>-<**F6**> to turn on Column Selection, highlight straight down to the beginning of the last line in the list, and press <**Tab**> once to insert tabs after all the items. You can now erase the spaces you inserted if you wish.

You may be fragmenting your Paradox tables.

Next you'll want to position your column of department numbers. Place the cursor on the first character in the department number list, and press <**Shift**>-<**F6**>. Highlight down to the bottom of the list and over far enough to include the longest item. Don't worry if you highlight paragraph marks with the short items. Press <**Alt**>-<**F3**> if you want to copy the list or <**Delete**> if you want to move it. Then place your cursor on the paragraph mark at the right end of the name list's top line. Press <**Insert**>, and the second column will line up with your second tab.

Bill Weil
San Francisco PC Users Group

Setting the Table for Better Paradox Performance

Whether you know it or not, as you delete and add records, you may be fragmenting your *Paradox* tables. Sometimes *Paradox* reuses the space from a deleted record for a new record, but sometimes it doesn't, and over time you can develop a lot of holes in your data files. These holes aren't visible when you view a table, of course, but it still takes time for *Paradox* to read across them. Cure this fragmentation with the Modify Restructure command. Use it to call up the table's structure. You don't have to change anything—just press <**F2**>, and *Paradox* will restructure the table and squeeze out any unused space.

In addition, most operations, such as queries and reports, are faster on smaller tables than on larger ones. Table size is a product of the number of records times the size of each record. Therefore, if you have seldom-used records or fields, consider moving them into a separate table. Of course, splitting up a table isn't worthwhile if you'll continually be using queries and other operations to join it back together again. So give careful consideration to which records it will be strategic to move.

Brian J. Smith
Southern California Paradox Users Group

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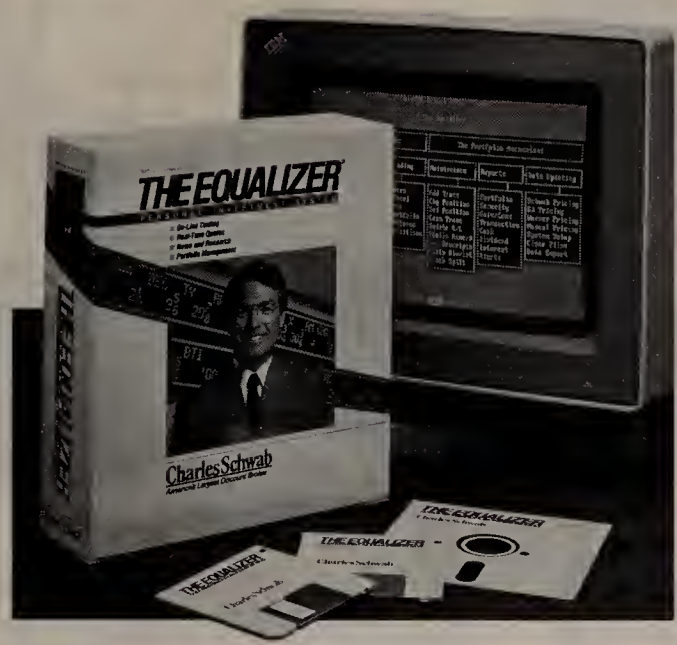

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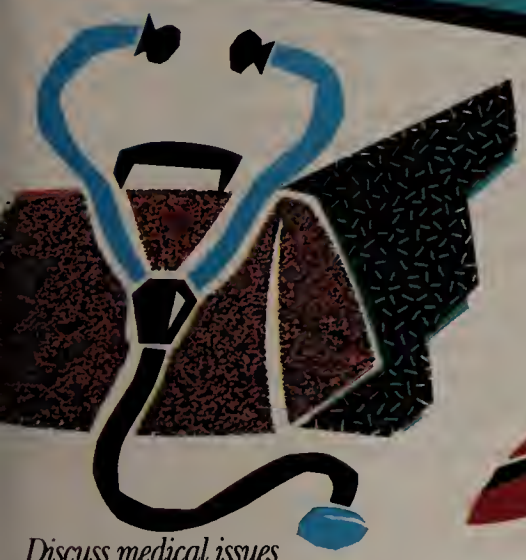

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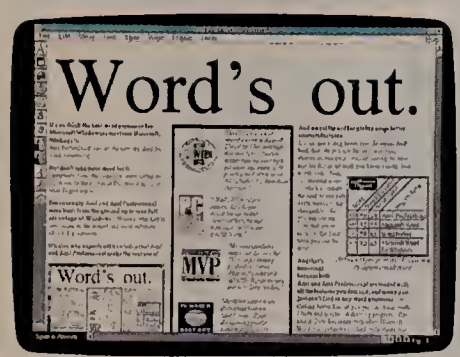

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CORPORATE TOP RATED PC WEEK 1990 SATISFACTION POLL

PC Week Poll of Corporate Satisfaction

- Amí Professional received a score in Ease of Use of the User Interface that was fully 10 points higher than the next highest score, and came in 14 points ahead of the score WordPerfect 5.1 drew from its buyers.

PC MAGAZINE EDITORS' CHOICE July 1990 Ami Professional Version 1.18

PC Magazine Editor's Choice

- Of all GUI word processors, Amí Professional has the widest variety of features and is perhaps the most enjoyable to use.

PC Computing MVP MOST VALUABLE PRODUCT

PC Computing MVP

- A stunning achievement, one that no other PC word processing product— not even Microsoft's estimable Word for Windows — can claim to have reached.

PC WORLD BEST BUY May, 1990

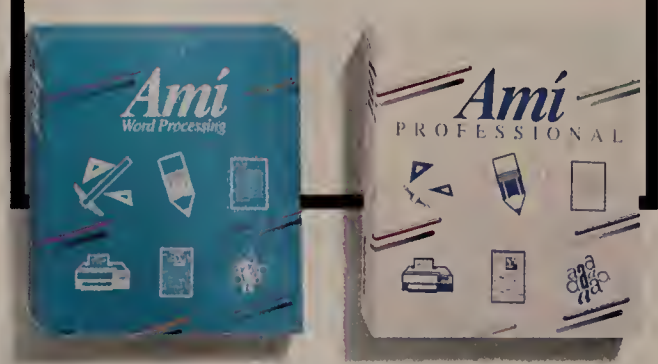
PC World Best Buy

- Amí Pro's easy to use formatting tools are hard to resist. If your documents typically include graphics, it's your Best Buy.

INFO WORLD EXCELLENT VALUE Jan. 29, 1990

Infoworld Excellent Value

- Easily handles graphics mixed with text, imports a host of text and graphics formats effortlessly, and does other office chores such as mail merge with ease and power.



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★★★	7.7	7.7	Microsoft Word
★★★	7.6	8.1	Word Perfect
★★★	7.2	6.7	Microsoft Word for Windows

Software Digest rates Amí Professional as the best word processor for Windows and the best word processor overall.

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STAR-DOT-STAR *.*

A global exchange of personal computer discoveries

Make WordPerfect perform like a chip off the old block, create a 1-2-3 macro for cursoring without cursor movement keys, stop a runaway print job, learn how one user solves "The COMSPEC Caper" on a Novell network, and discover a choice TSR programming tool.

Edited by Tom Swan

WordPerfect Block Party

With three simple macros [see **FIGURE 1**], I was able to imitate a non-PC editor's block commands that I was familiar with, making *WordPerfect 5.0* perform like a chip off the old block. The macros let me use simple key combinations to move, delete, or copy text blocks—much easier than using *WordPerfect*'s function keys.

After creating the macros, load or enter a sample document and highlight a block of text. To delete the block, press **<Alt>-D**. To move it, press **<Alt>-D**, move the cursor to the desired location, and press **<Alt>-R**. To copy it, highlight the block, press **<Alt>-C**, then move the cursor to the new location and press **<Alt>-R** to insert a copy.

Retrieving a deleted or copied text block doesn't erase the copy in memory; you can press **<Alt>-R** as often as you like to duplicate text passages.

Ginger Booth
Dallas, Texas

Editor's note: To create the macros, start with an empty document, type at least three letters, and position the cursor on the first letter. Doing so just gives the macro commands some marked text to digest—you don't have to save the document.

The delete-block macro will work only if Block (<Alt>-<F4>) is on. If you press **<Alt>-D** *while Block is off, you'll get a '* Please wait *' message that will remain until you press* **<F1>**. *If you feel comfortable with* WordPerfect's *macro editor, you can make this macro foolproof by putting the command* **{if}{state}&128~** *at the beginning of the macro and* **{end if}** *at the end.*

```
<Alt>-<F4>
<Cursor Right>
<Ctrl>-<F10>
<Alt>-D
Delete block<Enter>
<Ctrl>-<F4>bm
<F1>
<Ctrl>-<F10>
<Ctrl>-<F10>
<Alt>-R
Retrieve block<Enter>
<Shift>-<F10>
<Enter>
<Ctrl>-<F10>
<Alt>-<F4>
<Cursor Right>
<Ctrl>-<F10>
<Alt>-C
Copy block<Enter>
<Ctrl>-<F4>bc
<F1>
<Ctrl>-<F10>
```

FIGURE 1: Enter these keystrokes to create macros that can delete, move, copy, and retrieve WordPerfect 5.0 text blocks.

Cursorless Data Entry

Since my keyboard lacks a separate numeric keypad (a typical setup on many portables), when entering data in *1-2-3* I have to either press <Num Lock> constantly, forgo keypad entry, or give up using the cursor keys. Luckily, a simple macro [see **FIGURE 2**] gives me the best of both worlds: Keypad entry plus the ability to move to the next cell down without having to switch keyboard modes.

Enter the macro text at an out-of-the-way location, and name the first line **\C** using the command *Range Name Create*. To run the macro, move the cursor to the first cell where you want to enter values, press **<Alt>-C**, type your first cell of data, and press **<Enter>**. The cur-

(continues)

```
{?}~
{if @upper(@cellpointer("contents"))="STOP"}/re~/xq~
{d}{branch \c}
```

FIGURE 2: This 1-2-3 macro enables you to enter a column of data without using the cursor keys.

ANTHONY RUSSO

sor then moves down to the next cell. When you've finished entering data, type **stop** and press <**Enter**>.

To create another macro that moves the cursor horizontally, copy the macro to another range, change the '{d}' in line 3 to **{r}**, and name this range **\R**.

Vivek Wig
Moreno Valley, California

Somebody, Stop That Printer!

To abort print jobs or reset printer options to their default settings, I wrote a short utility, RESET.COM. To create the program, save the script in **FIGURE 3** as a plain ASCII file named RESET.DAT. Press <**Enter**> to create the blank line before 'rcx'. Then, from the DOS prompt, and with DEBUG.COM in a directory in the current PATH, type **debug reset.dat** and press <**Enter**>.

When you run the program, it calls the system's ROM BIOS routine number 17 hexadecimal—the same function that DOS calls when it boots to initialize the parallel printer ports.

Charles N. Jackson III
Silver Spring, Maryland

Editor's note: I modified Mr. Jackson's program to reset LPT1 and LPT2, which does no harm even if you have only one port. If you want only LPT1 reset, remove the three lines from 'inc dx' through 'int 17' and change 'f' to **b**.

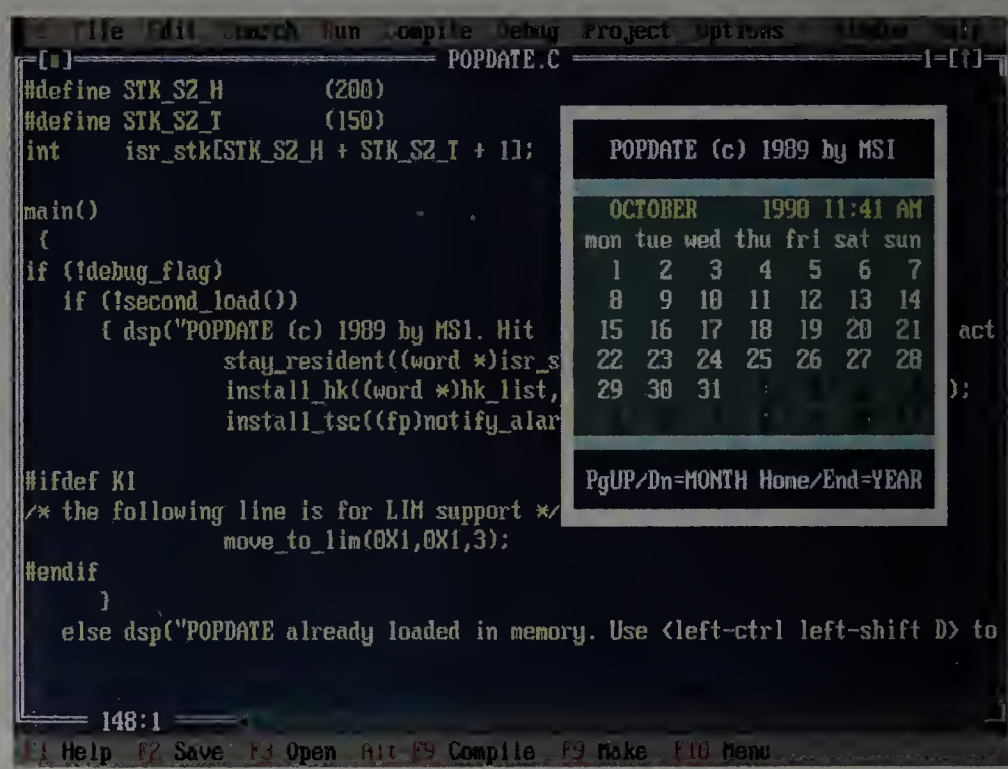
(continues)

DEVELOPER'S TOOLBOX

Saucy TSR Tools

Programming TSRs is a gutsy job. If you don't have the stomach for unappetizing tasks like monitoring keyboard interrupts, avoiding reentrant calls to DOS and the BIOS, and meeting other requirements that complicate resident pop-ups, you'd be wise to assign the programming to an expert TSR chef.

At least that was my thinking until I tried *CodeRunneR* from Microsystems Software. This interesting tool kit skillfully handles typical TSR duties such as trapping function hot keys and scheduling events—tasks that are generally run in the background. *CodeRunneR* lets you do all this with *Turbo C* or *Microsoft C*, and the results are nearly as fat free as those from crack assembly language programmers. Best of all, you don't have to be trained in TSR haute cuisine to start cooking resident code.



A sample TSR calendar written in C with CodeRunneR, displayed over the program's own source code in the Turbo C++ 1.0 editor.

CodeRunneR trims and speeds TSRs written in C (you can also use assembly language) by replacing standard run-time libraries with slim object-code modules. Unlike standard C run-time code, these modules add only the routines that an application requires.

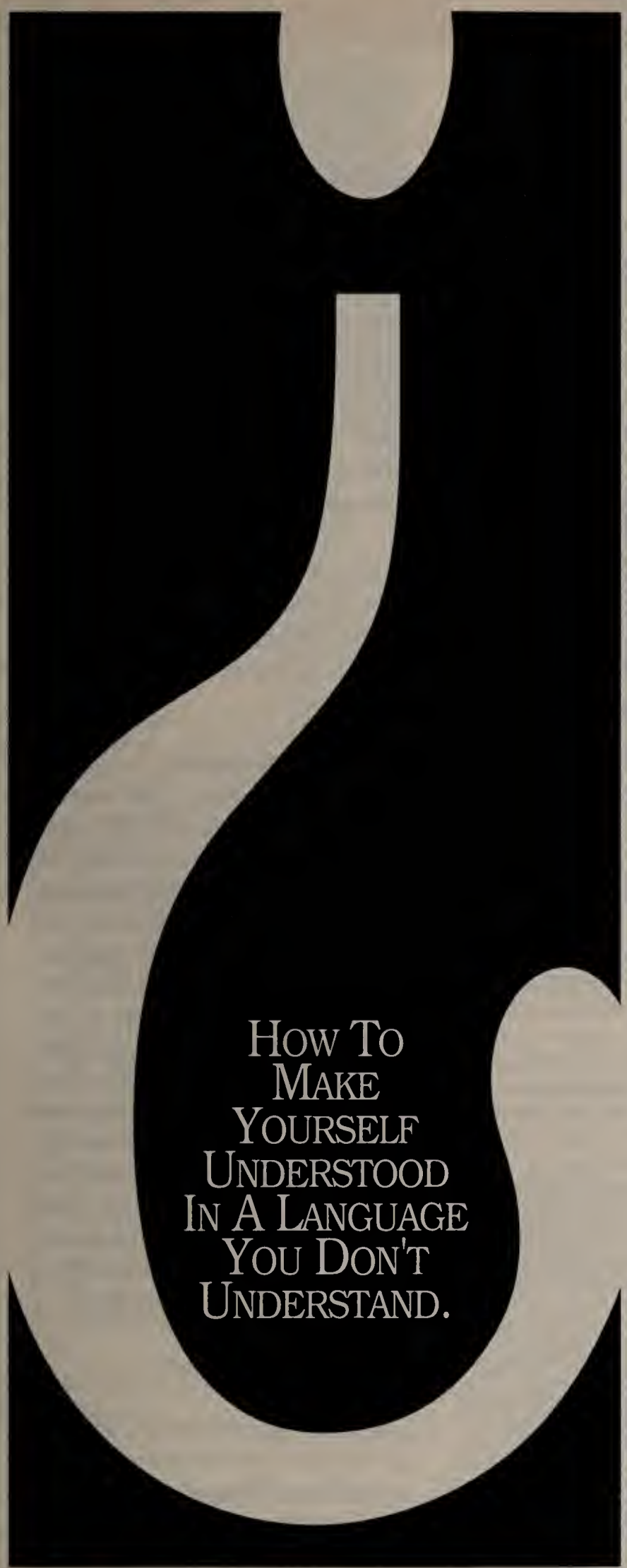
Also provided are custom start-up routines specially written for TSRs. The ASM source files for these modules are on disk, so you can fine-tune the instructions if necessary.

These and other refinements produce small EXE files—an important goal in TSR programming. But even more critical is what happens when the TSR loads into RAM. Typically, after installing its resident portion, the TSR's memory segments contain wasteful gaps formerly occupied by once-and-done functions and data—a routine to display a copyright notice, for example.

CodeRunneR recycles that kind of refuse in three ways. First, it lets you mark code and data for disposal. After loading the TSR, disposable space is recovered for DOS's use. This includes RAM occupied by your own code *and* by library routines called only by the TSR's loader—a clever scheme that minimizes memory consumption.

Second, after the TSR's installation routines are finished, *CodeRunneR* overlays the program's data segment to that same RAM space. This puts the poten-

(continues on page 284)



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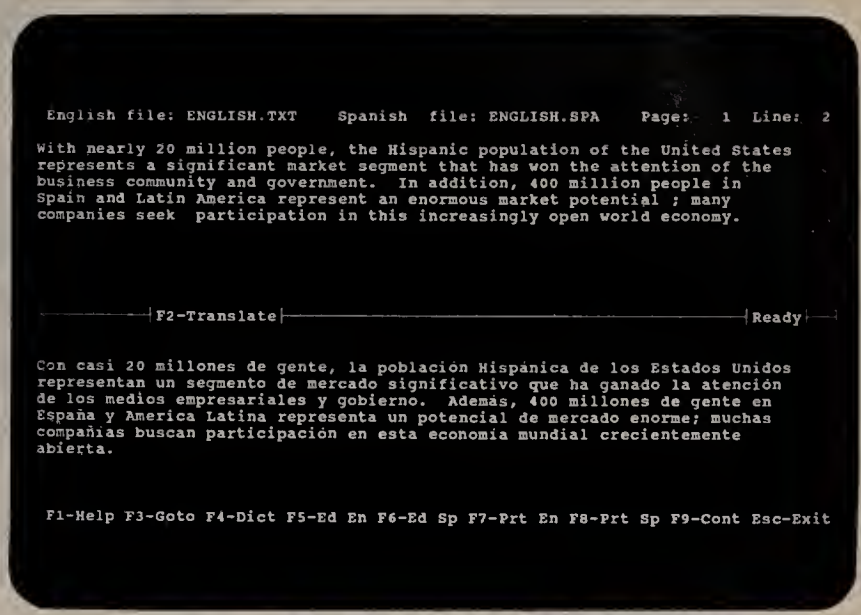

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—Winston Roberts
PCM Magazine

Translate

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November 12–16, 1990
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Booth # 4582

System requirements: IBM® XT® /AT®, PS/2® or compatible (8 Mhz. or higher recommended), DOS 3.0 or higher, hard disk, and 512K RAM.
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Circle 84 on reader service card

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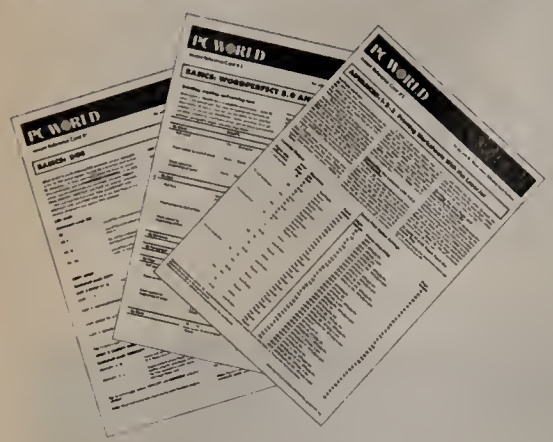

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```
a
mov ah,1
push ax
xor dx,dx
int 17
inc dx
pop ax
int 17
mov ah,4c
int 21

rcx
f
n reset.com
w
q
```

FIGURE 3: This DEBUG script creates RESET-.COM, which stops runaway print jobs and resets your printer to its defaults.

RESET should work with most network printing schemes. If you have a serial printer attached to your computer's RS-232 ports, you can't use RESET.

The COMSPEC Caper

On our Novell network, I use a custom log-in script to set the COMSPEC environment variable. The script tells DOS to reload COMMAND.COM from a network directory instead of from a user's disk, which allows users who don't have hard disks to switch floppies after booting. The problem was posed by Constantine Heger in "Floppy-Based Workstations" [*The Help Screen*, June 1990].

The method described in that item can be automated by placing the command **COMSPEC = S*x*:COMMAND.COM** into your log-in script, where *x* is the search drive number. The network administrator can place the command in a system log-in script to do this systemwide.

Richard Kinney
Kennewick, Washington

Tom Swan is a contributing editor for PC World *and the author of* Mastering Turbo Debugger *and* Mastering Turbo Pascal 5.5 *(Howard W. Sams and Co., Carmel, Indiana, 1990 and 1989).*

Share your tips and discoveries with PC World *readers; see How to Contact PC World, page 4.*

PC WORLD

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BASICS: MICROSOFT WORD 4.0 AND 5.0

MOVING THE CURSOR

What to do: After you lood a document, use these keyboord or mouse techniques to move the cursor oround. Mouse users can usuolly move the mouse pointer and click the left or right or both mouse buttons; for some mouse operotions, you must point ot the scroll bar on the left window border ond click the appropriate button(s). The mouse pointer's shape or color may chonge depending on its location.

Move cursor	Keyboard commands	Mouse pointer position/Button click
One character or line	Cursor keys	Desired position/Left
To start of line	<Home>	Start of line/Left
To end of line	<End>	End of line/Left
Down one screen	<Page Down>	Bottom of scroll bar/Right
Up one screen	<Page Up>	Bottom of scroll bor/Left
To start of previous poragraph	<Ctrl>-<Cursor Up>	Desired position/Left
To start of next paragraph	<Ctrl>-<Cursor Down>	Desired position/Left
To previous word	<Ctrl>-<Cursor Left>	Previous word/Left
To next word	<Ctrl>-<Cursor Right>	Next word/Left

MOVING THE CURSOR (continued)

To top of window	<Ctrl>-<Home>	Desired position/Left
To bottom of window	<Ctrl>-<End>	Desired position/Left
To start of document	<Ctrl>-<Poge Up>	Top of scroll bor/Both
To end of document	<Ctrl>-<Page Down>	Bottom of scroll bar/Both

Note: If you use the mouse to scroll through text or to jump to the stort or end of o document, you must place the pointer in the text ond click the left mouse button if you wont to type or edit text. If you don't, the screen will jump back to the original cursor position.

SELECTING TEXT

What to do: Word is easiest to use if you enter text, select it, ond then edit or format it. Selected text appeors reversed on screen. **Note:** In some coses, mouse users must ploce the pointer in Word's selection bar—the blank column to the left of text—ond click odjacent to the desired text block.

Fold Here

SELECTING TEXT (continued)

Select	Keyboard commands	Mouse pointer position/Button click
Choracters	<Shift>-cursor key	Current character/ Left ond drog
Previous word	<F7>	Previous word/Right
Next word	<F8>	Next word/Right
Previous sentence	<Shift>-<F7>	Within sentence/Both
Next sentence	<Shift>-<F8>	Within sentence/Both
Current line	<Shift>-<F9>	Selection bar/Left
To beginning of line	<Shift>-<Home>	Current chorocter/ Left and drag
To end of line	<Shift>-<End>	Current choracter/ Left and drag
Previous paragraph	<F9>	Selection bor/Right
Next parograph	<F10>	Selection bar/Right
To end of document	<Shift>-<Ctrl>-<Page Down>	Current charocter/ Left and drag to bottom border
Entire document	<Shift>-<F10>	Selection bar/Both
Column	<Shift>-<F6>, cursor keys to define column	Desired position/Left, <Shift>-<F6>/Left ond drag to define column

Tip: To extend a selection, press **<F6>**, then use the keyboord or mouse oction above. Mouse users can press **<F6>**, point at the last choracter, and click any button to extend the selection. Press **<F6>** again to stop extending.

EDITING TEXT—KEYBOARD

What to do: Once you select a block of text, you can move it, delete it, temporarily stash it in Word's Scrap areo, or change its formotting. You con also sove selected text as a glossary entry for use in ony document. **Note:** Text in *itolics* represents variable information you should supply.

EDITING TEXT—KEYBOARD (continued)

Action	Keyboard commands
Delete to Scrop	<Delete>
Delete permanently	<Shift>-<Delete>
Paste Scrap contents into document	<Insert>
Reploce current selected text with Scrap contents	<Shift>-<Insert>
Copy text to glossary	<Esc>C, *glossory nome*, <Enter>
Insert text from glossory	*glossory nome*, <F3>
Save glossory	<Esc>TGS, *file nome*, <Enter>

Tip: Text stored in the Scrop remoins there until you delete more text or exit Word. You can insert Scrap text anywhere, including into another window or document.

EDITING TEXT—MOUSE

What to do: Most editing is done from the keyboard, but mouse users can quickly move and copy text without moving it to Word's Scrap. The steps: Select the text first, move the mouse pointer to the position described below, ond issue the proper keystroke–mouse button combination.

To place selected text in front of:	Point at:	To copy (keystroke-button):	To move (keystroke-button):
A character	The chorocter	<Shift>-Left	<Ctrl>-Left
A word	The word	<Shift>-Right	<Ctrl>-Right
A sentence	The sentence	<Shift>-Both	<Ctrl>-Both
A line	Selection bar beside line	<Shift>-Left	<Ctrl>-Left
A parogroph	Selection bor beside paragraph	<Shift>-Right	<Ctrl>-Right
Beginning of the document	Anywhere on selection bar	<Shift>-Both	<Ctrl>-Both

PC WORLD

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ADVANCED: MICROSOFT WORD 4.0 AND 5.0

FORMATTING TEXT

What to do: Once you select text, you can format it with a number of shortcut keys. Remember: Select text first, then format it. No mouse shortcuts exist for these commands, but you may use the mouse with the Format Character menu.

Select font from list	<Alt>-<F8>, <F1>, select font, <Enter>
Select font size from list	<Alt>-<F8>, <Tab><F1>, select size, <Enter>
Boldface	<Alt>-B
Italics	<Alt>-I
Underline	<Alt>-U
Double underline	<Alt>-D
Small caps	<Alt>-K
Strikethrough	<Alt>-S
Superscript	<Alt>-<=>
Subscript	<Alt>-<->
Hidden text	<Alt>-E
Remove all character formatting	<Alt>-<Space>

FORMATTING TEXT (continued)

Tip: To format a single character under the cursor, hold down the **<Alt>** key and press the appropriate letter twice.

Mouse tip: To copy a character format, select the text to be formatted, move the mouse pointer to a character with the desired format, hold down **<Alt>**, and click the left mouse button.

Note: You can also issue a formatting command, then type. All characters typed will be in the chosen format until you change it with another command.

FORMATTING PARAGRAPHS

What to do: These commands act on the paragraph containing the cursor or on multiple paragraphs that have been selected. No mouse shortcuts exist for these commands, but you can select the commands in the Format Paragraph menu. **Note:** A paragraph is any text followed by a carriage return.

Center	<Alt>-C
Flush left	<Alt>-L
Flush right	<Alt>-R
Justify	<Alt>-J
Double-space	<Alt>-2

Fold Here

Fold Here

FORMATTING PARAGRAPHS (continued)

Single-space (*Word 5.0* only)	<Alt>-1
Single-space	<Esc>FP<Cursor Down><Cursor Down>1<Enter>
Add space above	<Alt>-O
Increase left margin	<Alt>-N
Decrease left margin	<Alt>-M
Increase both margins (*Word 5.0* only)	<Alt>-Q
Indent first line	<Alt>-F
Hanging indent	<Alt>-T
Remove paragraph formatting	<Alt>-P

Mouse tip: To copy a paragraph format, select the text to be formatted, move the mouse pointer to the selection bar next to a preformatted paragraph, hold down the **<Alt>** key, and click the right mouse button.

QUICK KEYSTROKE OPERATIONS

Action	Keyboard commands
Load file from list	<Ctrl>-<F7>, select file, <Enter>
Save file	<Ctrl>-<F10>
Undo last command or edit	<Shift>-<F1>
Repeat a search	<Shift>-<F4>
Get help	<Alt>-H
Check spelling	<Alt>-<F6>
Use thesaurus	<Ctrl>-<F6>
Switch display modes	<Alt>-<F9>
Print preview (*Word 5.0* only)	<Ctrl>-<F9>
Print file	<Ctrl>-<F8>

Mouse tip: Mouse users can get help by clicking on the question mark at the bottom of the screen.

WINDOW OPERATIONS

What to do: You can use the keyboard or mouse to create, zoom, or remove windows. Load *Word* and follow the steps below. You can load different documents into any given window; *Word* displays up to eight windows at a time. **Note:** Since using the mouse for these operations requires *Word*'s borders, press **<Esc>O**, then **<Tab>** to the Screen Borders field (Show Borders in *Word 5.0*), type **Y**, and press **<Enter>**.

Action	Keyboard commands	Mouse pointer position/ Button click
Open vertical window	<Esc>WSV, *column number*, <Enter>	Top border/Left
Open horizontal window	<Esc>WSH, *line number*, <Enter>	Right border/Left
Open empty window	<Esc>WSH, *line number*, <Tab>Y <Enter>	Top or right border/ Right
Move cursor from window to window	<F1>	Desired window/Left
Zoom a window	Place cursor in window, <Ctrl>-<F1>	Window number/Right
Switch zoomed windows	<F1>	Window number/Left
Unzoom a window	<Ctrl>-<F1>	Window number/Right
Close window	<Esc>WC, *window number*, <Enter>	Top or right border/ Both
Resize window	<Esc>WM, *window number*, <Tab>, *row number*, <Tab>, *column number*, <Enter>	Lower right corner/Left and drag along border

Note: You must have two or more windows open to use the zoom function.
Note: You can't resize the right-most window or a window at the bottom of the screen.

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DEVELOPER'S TOOLBOX

(continued)

tially wasted RAM back into service.

Third, *CodeRunneR* relocates the far heap—the pool of memory where pointers address variables created at run time. To use this feature, you must create a function that updates far-pointer segment addresses. At run time, the function receives a relocation value, which your code can use to aim pointers back at their moving targets. This is every bit as tricky as it sounds, but the memory savings should more than offset the extra programming required.

To help you get started with TSR programming, *CodeRunneR* comes with sample source code. There are two clock programs, two calculators, a pop-up calendar, and a keyboard scan-code window that shows key values. These programs can't compete with similar commercial utilities, but they make good templates for your own work. Also provided are custom start-up routines specially written for TSRs.

I have only one complaint with *CodeRunneR*: You have to register the product to receive extra sample programs and an improved math library. Even though these items are free, you'll probably have to wait several days for them to arrive. On a positive note, the company promises to make these files available for downloading from its BBS at no charge. You still have to pay any long-distance tolls, but even so, I sure wish other companies would adopt comparable policies.

If you're looking for the TSR tool that's the cream of the crop, try *CodeRunneR*. It's got all the ingredients C programmers need to bake four-star RAM-resident treats.

Let's talk it over. My MCI Mail handle is TSWAN; my CompuServe ID is 73627,3241. —*Tom Swan*

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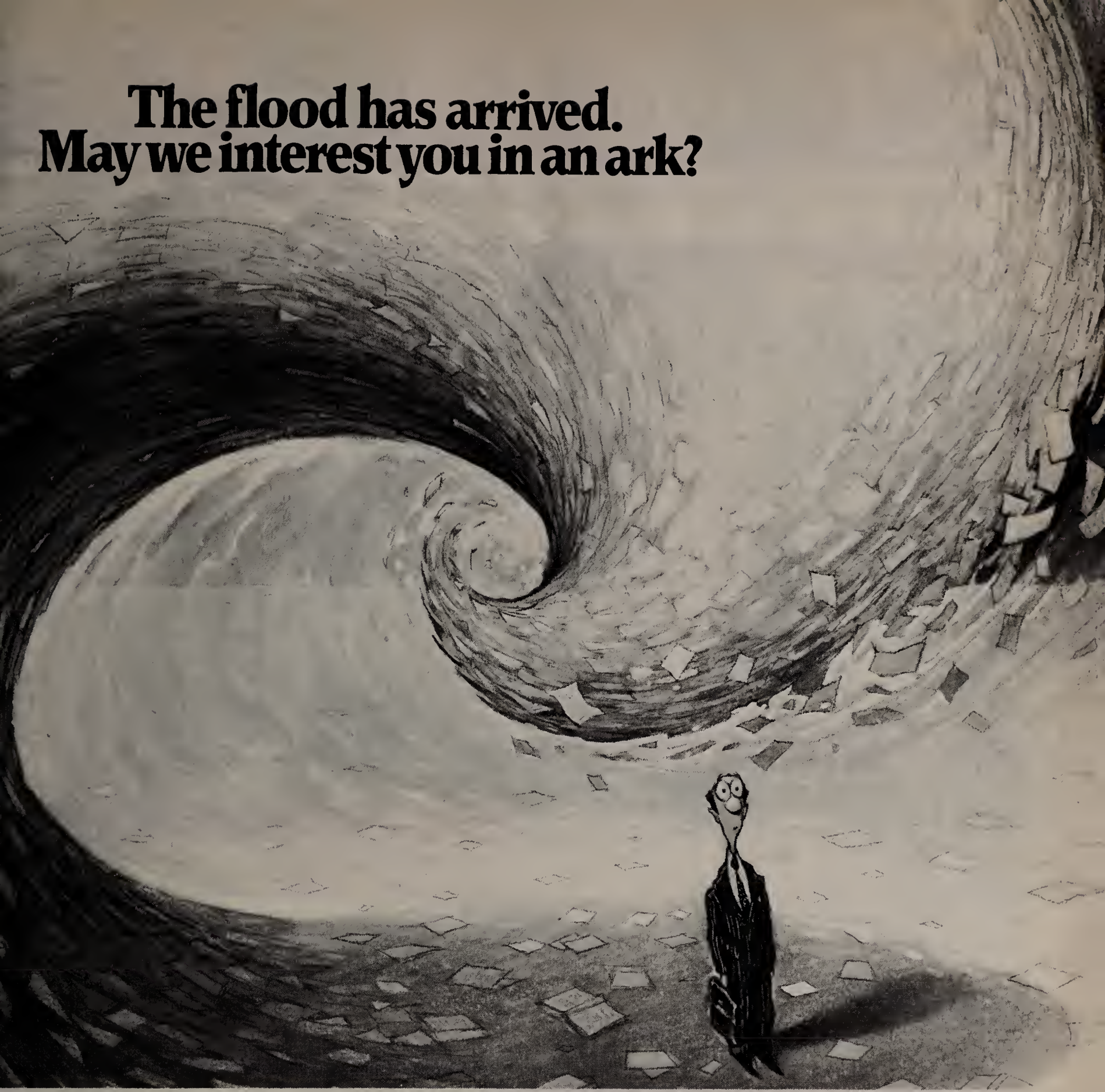

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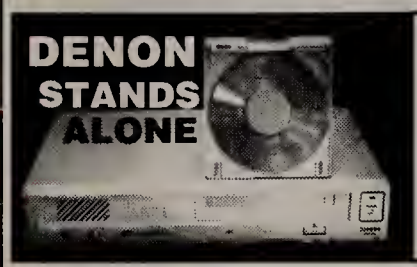

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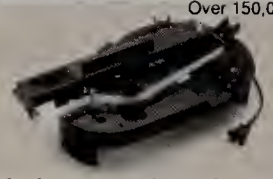

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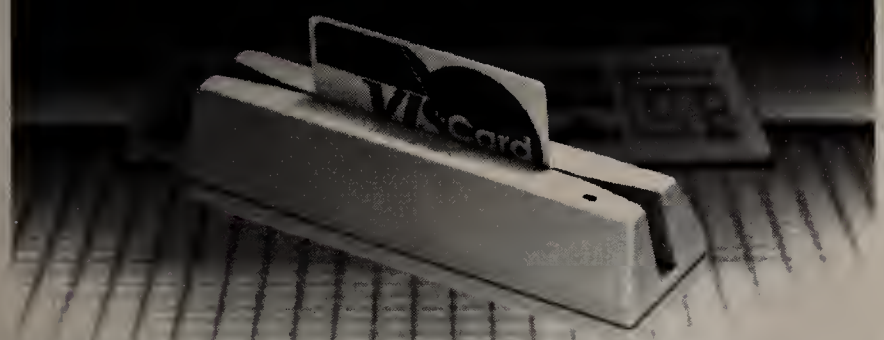

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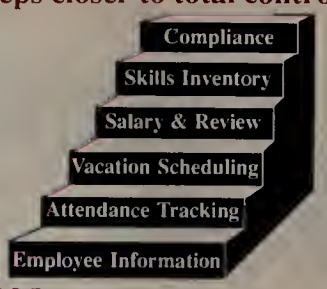

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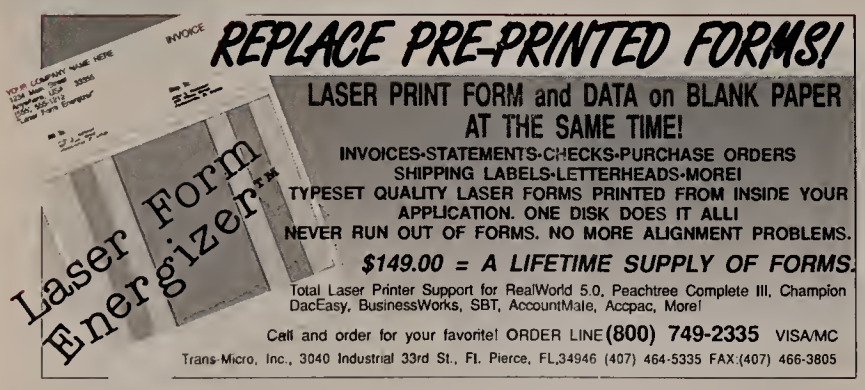

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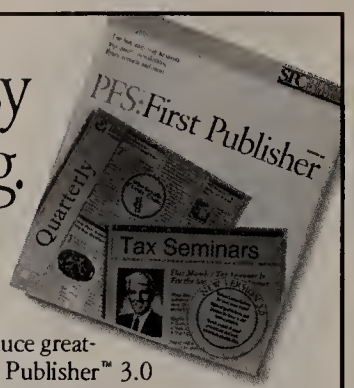

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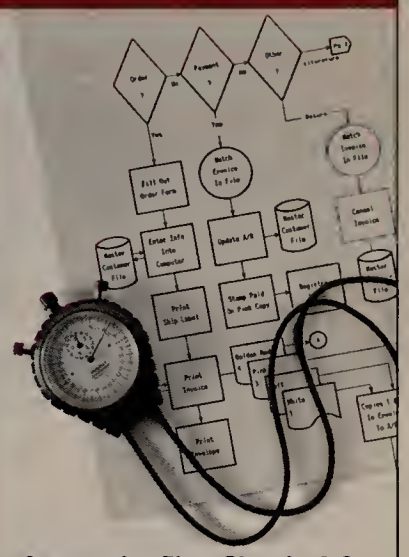

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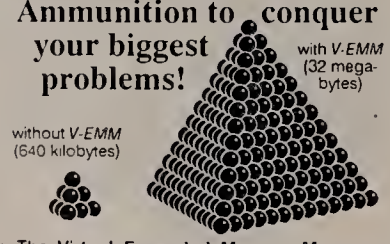

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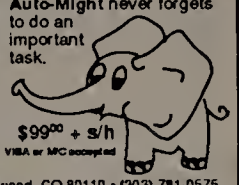

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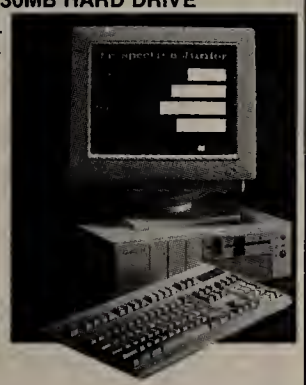

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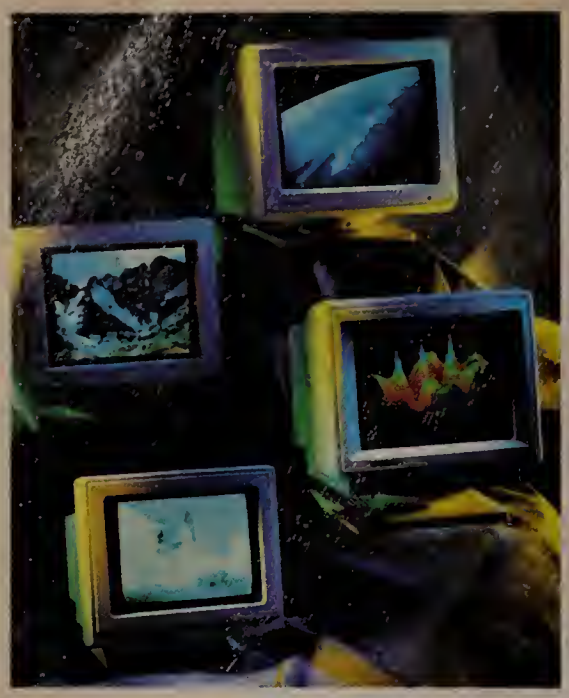

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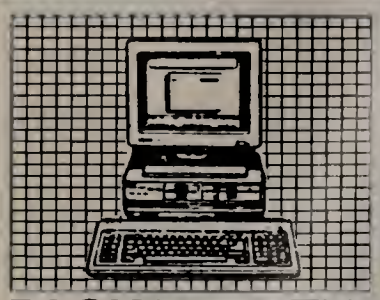

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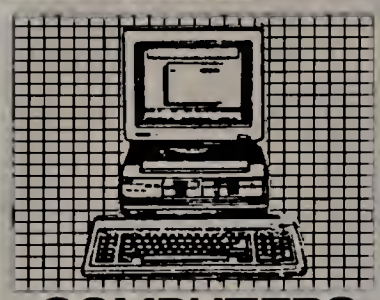

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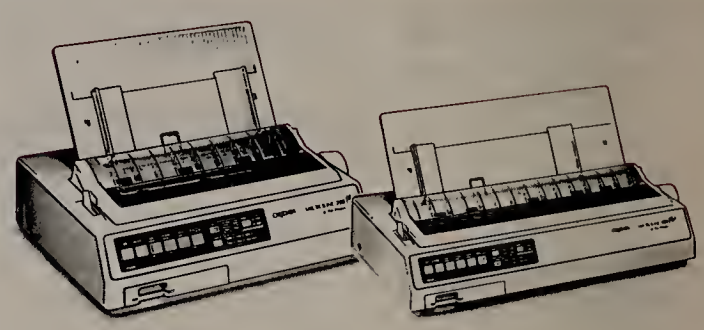

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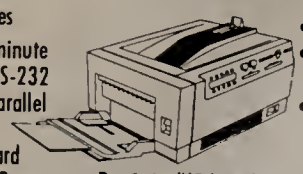

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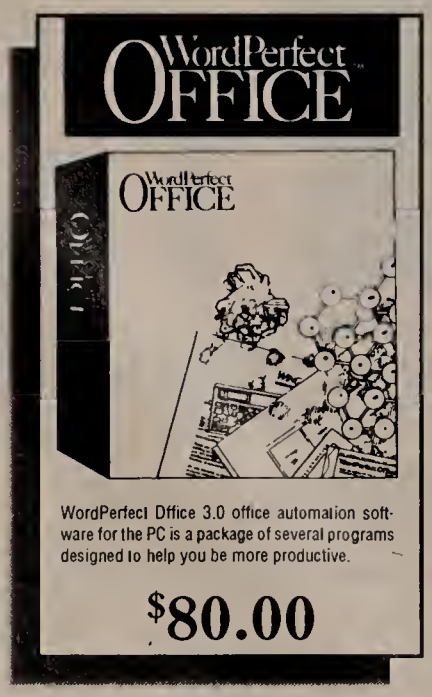

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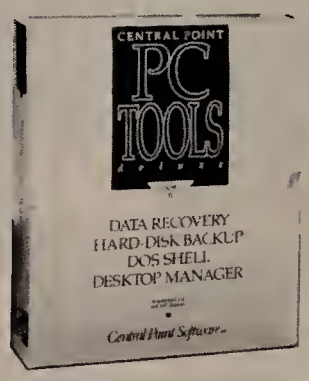

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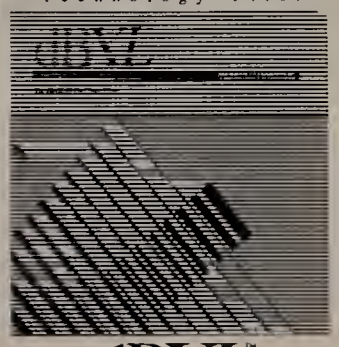

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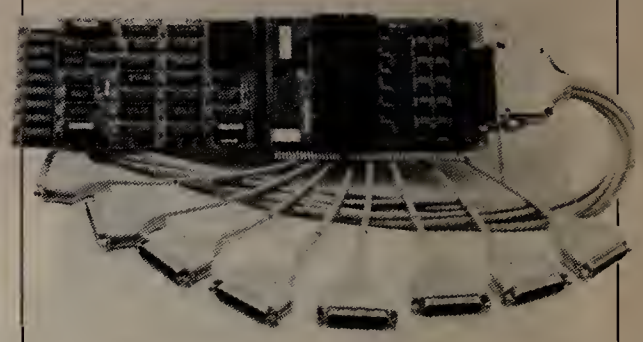

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VGA Monitor **$1288**

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T-5200 40 MB	CALL
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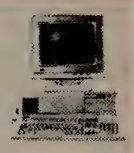

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(IBM XT Comp.)
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4641	$1499
5541	CALL
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EPSON T-750	$289
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HP Laser Jet III D	CALL
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4 MB Ram Expander	$449
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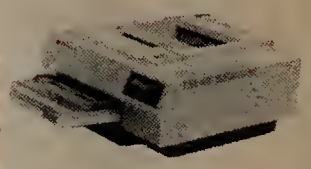

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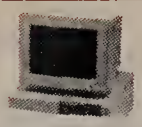

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NEC	CALL
SAMSUNG	CALL
ZENITH	CALL

Other Models Available—Call

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Hayes	CALL
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Can your cash register tell you what's in stock, control your inventory, check and correct prices automatically, provide quicker service, get more repeat business, and optimize your purchasing? **The Retail Controller Jr.** will help you leapfrog past your competition, reduce shrinkage, billing errors, costs, and time. It puts the profit-building speed, accuracy, and power of microcomputers to work for you. It's like replacing your cash register with a cash generator!

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With **The Retail Controller Jr.**, you'll make smarter management decisions because you'll have pushbutton-quick, down-to-the-penny information. Operating at your sales counter, the program captures vital customer and sales data, organizes it, and presents it in neat, accurate reports that eliminate guesswork and improve control.

Bar Code Easy, Feature Packed

The Retail Controller Jr. is designed for first-time computer users. Even a brand new clerk can learn how to process transactions in minutes. The speed and efficiency of barcoding (optional) can keep keystrokes to a minimum. Pull- down menus, on-screen help windows, and "point and select" customer and product lookup all help to make the program almost intuitively easy to use. All transactions are performed from just one Work Screen. Yet it incorporates many of the features you'd expect to find only in systems costing hundreds of dollars more, features like:

- ✔ automatic credit card verification
- ✔ bar code compatibility
- ✔ color/size matrix
- ✔ multiple pricing levels
- ✔ tracks inventory by size/color/style
- ✔ mailing labels
- ✔ tracks customer history
- ✔ daily closeout reports
- ✔ accepts split tender
- ✔ view in-stock status
- ✔ pull down menus
- ✔ pop-up windows
- ✔ source code available
- ✔ 99 levels of password protection
- ✔ tracks promotional sales
- ✔ prints bar code labels
- ✔ reorder reports
- ✔ extensive sales reports
- ✔ item/invoice discounts
- ✔ tracks sales by employee
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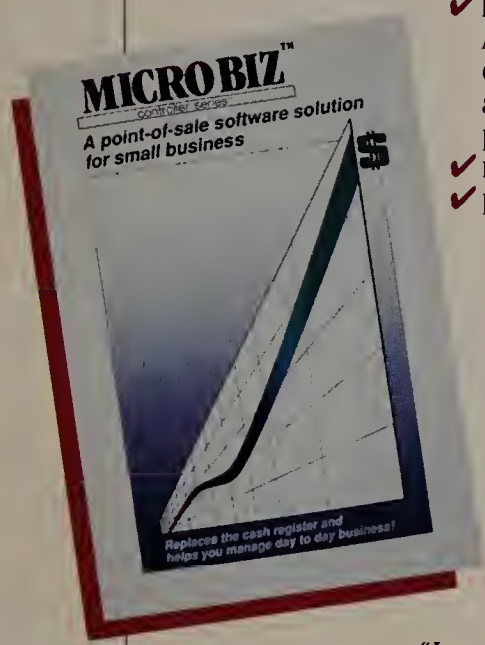

"I can't imagine running my shop without it. The program gives me much better control over all my items and has more than paid for itself."
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You didn't go into business for yourself to do things someone else's way. Fortunately, we did. We've already computerized thousands of different retail stores, video stores, auto repair centers, beauty salons, clothing stores, health clubs, pet, furniture, liquor, and hardware stores . . . . So we've learned how to make **The Retail Controller Jr.** flexible enough to do the job for you by building in a number of custom-designed options. Use it with or without a bar code reader, cash drawer, or receipt printer. And, if at a later date you need the additional features of **The Retail Controller Sr.** (accounts receivable, purchase orders, layaway plans), you can upgrade easily and economically at any time.

It Pays for Itself — or You Don't. Guaranteed!
*We believe in our product, and thus offer a **100% No-Risk Guarantee.** If you are not satisfied with any unregistered MicroBiz program for any reason, you may return it within 30 days for a complete refund.*

❑ *The Retail Controller Jr.*	**$179.95**
❑ *The Video Store Controller Jr.*	**295.00**
❑ *The Auto Repair Shop Controller Jr.*	**295.00**
❑ *Cash Drawer*	**395.00**
❑ *Receipt Printer*	**495.00**
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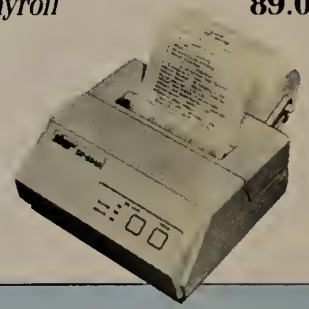
(The Controller Jr. Series automatically links to Computer Associates' ACCPAC modules)



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TAKING IT HOME

The practical guide to home/office computing

A modem is a must.

Lawrence J. Magid

I've said it many times before: No home computer is complete without a modem and access to an on-line service or electronic mail system. Now I have a powerful ally—IBM has made a built-in 2400-bps modem and two on-line starter subscriptions key elements in the marketing and support of its new PS/1. While you may choose to bring home another brand of PC, I hope you'll put a modem in it. Here are three good reasons why.

The first is Prodigy. If you do buy a PS/1, IBM will give you a free three-month subscription to this on-line service, which is more tailored to nonbusiness home applications than most. I write columns and answer users' questions on Prodigy. But I would use it even if I weren't associated with the service, because it's inexpensive (you get unlimited access for $9.95 a month) and has interesting entertainment, education, and *personal* business features.

With Prodigy you can make airline reservations, do home banking, shop, read news, or use hundreds of other services without worrying about hourly fees. I use it to arrange all my business travel, and I got lots of good advice from Prodigy members and travel experts before a recent trip to Europe.

Prodigy avoids charging for on-line time by selling advertising in a banner that appears at the bottom of the screen. The biggest limitation of the service is that it doesn't let you upload or download text files or software.

If it's in-depth information I'm after, I dial up CompuServe. The prices are reasonable as on-line services go, but they're still not cheap—$12.50 per hour at 1200 or 2400 bps for most features, plus a $1.50-per-month membership fee. Some unusual features also require a hefty surcharge, so there are months when my CompuServe bill exceeds $100.

One of my favorite CompuServe features is Computer Database Plus, which provides abstracts and/or the full text of articles from more than 100 computer publications. Unfortunately, the service costs an additional $24 an hour, plus a $2.50 charge for each full-text version of an article. Pricey—but for me it's still cheaper than half a day at the library.

For in-depth information, I dial up CompuServe.

Ever need demographic information? CompuServe's Supersite data base will give you details down to the ZIP code level for every county in the United States. Want to know who you're doing business with? CompuServe lets you access TRW credit reports on more than 13 million businesses. You also can use CompuServe electronic mail and computer bulletin boards, and download public domain software and shareware.

What I can't find on CompuServe I usually find on Knowledge Index, from Dialog Information Service. I use Knowledge Index to read articles from major newspapers like the *Boston Globe* and *Los Angeles Times*. I've also used it to search through the *Harvard Business Review* and various technical and scientific journals. The newspaper data base gives you the full text of articles, while most of the magazine and journal articles exist only as abstracts.

Knowledge Index doesn't offer all the communications and personal information features of CompuServe, Prodigy, or other on-line services. It isn't as easy to use as CompuServe, it charges more than either ($24 per hour, but with no additional surcharges), and it's available only on weekends and after 6 p.m. on weekdays. Once you learn it, though, Knowledge Index can be cost-effective and incredibly productive. I usually can complete a search for under $5.

I've only scratched the surface with these three services; there are dozens of other electronic libraries and broad-based or vertical information services to investigate—as well as hundreds of free BBS's from which you can download software using your modem.

Next time, we'll look at how you can use the computer to stay in touch with colleagues across town or across the country.

Lawrence J. Magid is a nationally syndicated computer columnist.

Prodigy, 800/776-3449
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CompuServe Information Service, 800/848-8199
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